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The Relationship between Fat Stereotypes and Body Dissatisfaction in Normal Weight  
Women: A Mediated Moderation Model

By

Jean Kim, M.A.

A Dissertation  
Submitted to the Faculty of Graduate Studies  
through the Department of Psychology  
in Partial Fulfillment of the Requirements for  
the Degree of Doctor of Philosophy  
at the University of Windsor

Windsor, Ontario, Canada

2018

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The Relationship between Fat Stereotypes and Body Dissatisfaction in Normal Weight  
Women: A Mediated Moderated Model

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October 29, 2018

## DECLARATION OF ORIGINALITY

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## ABSTRACT

Fat stereotypes refer to beliefs about traits that are considered characteristic of individuals carrying excess weight. Endorsing these beliefs is associated with negative body image in overweight and obese individuals. In normal weight women, however, these beliefs have a more nuanced effect on body image. The purpose of these studies was to extend existing literature on the relationship between fat stereotype endorsement and body dissatisfaction in normal weight women. A mediated moderation model was proposed. Specifically, body surveillance was investigated as a moderator of the relationship between fat stereotype endorsement and body dissatisfaction. Further, downward physical appearance comparison was examined as a potential mediator of this moderated effect. This model was examined in both a Caucasian-only sample, as well as a full, ethnically heterogeneous sample. As hypothesized, body surveillance significantly moderated the relationship between fat stereotype endorsement and body dissatisfaction in the Caucasian sample in Study 1. Greater endorsement of fat stereotypes predicted greater body dissatisfaction in women with lower body surveillance. In women with higher body surveillance, fat stereotypes were unrelated to body dissatisfaction. These results suggest that for women who do not regularly monitor their appearance, endorsing fat stereotypes is harmful to their body image. However, body dissatisfaction is more resistant to varying levels of fat stereotype endorsement in women who regularly monitor their body. In Study 2, an experimental design was used to manipulate fat stereotype endorsement. To increase fat stereotypes in the support condition, information about the controllable causes of excess weight (e.g., diet, exercise, etc.) was presented. To decrease fat stereotypes in the challenge condition, information about the uncontrollable causes of

excess weight (e.g., genetics, food-rich environment, etc.) was presented. As hypothesized, body surveillance moderated the impact of study condition (support vs. challenge) on body dissatisfaction in Caucasian women. However, women with lower body surveillance reported *lower* body dissatisfaction in the support condition compared to those in the challenge condition. In contrast, women with higher body surveillance did not differ in their reports of body dissatisfaction depending on study condition. Similarly to Study 1, these results indicate that for women with greater body surveillance, their body appraisals are resistant to change based on weight control information and fat stereotype endorsement. For normal weight women who are less conscious of their body, it is possible that information about the controllable causes of excess weight improves their body satisfaction by eliciting an internal locus of control, and affirming that they are engaging in appropriate weight management behaviours. Notably, these significant findings were observed in Caucasian women only in both studies. The interactions were not significant in the full, ethnically heterogeneous sample. This pattern was expected, and confirms that the relationships between body image and weight stigma are impacted by race and ethnicity. Finally, the interaction did not significantly predict downward physical appearance comparison in either study. Thus, downward physical appearance comparison was not the mechanism through which the observed interactions between fat stereotypes and body surveillance impacted body dissatisfaction, and the mediated moderation model was not supported.

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## Chapter I

### The Relationship between Fat Stereotypes and Body Dissatisfaction in Normal Weight

#### Women: A Mediated Moderation Model

Increasing societal focus on health and physical appearance has generated concerns about the stigmatization of overweight and obese individuals. Prejudice against this group is described as one of the last acceptable forms of bias in modern society (Puhl & Brownell, 2001). Indeed, research indicates that negative attitudes toward overweight and obese individuals are considered to be more acceptable than are negative attitudes toward other groups, including individuals with physical disabilities (Latner, Stunkard, & Wilson, 2005), with AIDS, and those of various races (Crandall, Eshleman, & O'Brien, 2002). Further, weight-based prejudice and discrimination have been documented across many domains of life. Overweight and obese individuals receive unfair treatment in employment and hiring (e.g., Roehling, 1999), health care services (e.g., Brochu & Esses, 2009; Schwartz, Chambliss, Brownell, Blair, & Billington, 2003), and education (e.g., Crandall, 1991; Puhl & Latner, 2007). Given the pervasiveness of anti-fat stigma, researchers have investigated several social and clinical consequences that result from weight bias (see Puhl & Heuer, 2009 for a review). Much of the focus of research has been on how fat stereotyping affects its recipients. The current research aims to extend the literature examining how fat stereotypes affect those who hold them.

#### **Clinical Relevance of Endorsing Fat Stereotypes**

Fat stereotypes refer to beliefs about traits that are considered characteristic of individuals carrying excess weight and fat (Puhl & Brownell, 2001). Common fat stereotypes include beliefs that overweight and obese individuals are lazy, unfriendly,

unintelligent, and lack willpower (Puhl & Brownell, 2001), among others. Numerous studies have shown that people of all weight categories commonly endorse these fat stereotypes. For example, a population-based investigation found that 23.5% of 1000 participants held “definite stigmatizing attitudes” toward obese individuals, with no difference in reported levels of stigma across genders (Hilbert, Rief, & Braehler, 2008). Stigmatizing attitudes were defined in this study as the extent of agreement with statements exemplifying fat stereotypes, such as “fat people have no willpower” and “most fat people are lazy”. Similarly, Swami, Pietschnig, Stieger, Tovée, and Voracek (2010) examined the extent to which individuals endorse fat stereotypes. These authors found that across their total sample of 1024 participants, fat stereotypes such as laziness and insecurity were moderately endorsed. These large-scale studies indicate that fat stereotypes are commonly held in modern society.

Given the research demonstrating that fat stereotypes are commonly held, researchers have investigated potential negative mental health outcomes resulting from this endorsement. This research has focussed mostly on negative outcomes in overweight and obese individuals who themselves endorse fat stereotypes. Generally, these studies indicate that holding fat stereotypes is associated with a number of negative psychological outcomes, such as low self-esteem (Friedman et al., 2005; Klaczynski, Goold, & Mudry, 2004), depressive symptomatology (Durso & Latner, 2008; Friedman et al., 2005), anxiety (Durso & Latner, 2008) and, notably, body dissatisfaction (Friedman et al., 2005).

**Body dissatisfaction and fat stereotypes.** Body dissatisfaction is a key facet of body image disturbance (Thompson & Stice, 2001). It refers to the negative subjective

evaluation of one's body, including body shape, weight, and specific body parts, such as one's stomach or thighs (Stice & Shaw, 2002). Body dissatisfaction is considered to be a key predictor of the development of disordered eating behaviours (Stice, 2001), and is described as an essential precursor to clinical eating disorders (Polivy & Herman, 2002). This demonstrated relationship between body dissatisfaction and eating disorders is one reason why researchers have investigated the factors that contribute to the development of body dissatisfaction. Further, though body dissatisfaction commonly is reported among men and women of all weight categories, women tend to report greater body dissatisfaction than do men (Cash, Morrow, Hrabosky, & Perry, 2004; Frederick, Forbes, Grigorian, & Jarcho, 2007). Indeed, body dissatisfaction is so widespread amongst North American girls and women that it has been considered normative for over three decades (Rodin, Silberstein, & Striegel-Moore, 1984). Additionally, women tend to report greater overweight preoccupation than do men (Cash et al., 2004), and women constitute the vast majority of eating disorders sufferers (Ingram & Price, 2010). Therefore, understanding the factors contributing to body dissatisfaction, especially in women, is of prime importance. Accordingly, the current research focuses on the potential impact of fat stereotype endorsement on body dissatisfaction in women.

Research on the relationship between body dissatisfaction and endorsed fat stereotypes is fairly recent and disproportionately conducted with overweight and obese samples. Findings vary slightly depending on whether the measurement of fat stereotypes is implicit or explicit. Implicit measures indirectly assess automatic beliefs and are intended to access processes that are outside conscious control, whereas explicit measures refer to self-report questionnaires that ask participants to express their beliefs directly.

Despite some variability across measurement methods, findings generally indicate that overweight and obese individuals who endorse fat stereotypes report greater body dissatisfaction than do overweight and obese individuals who do not endorse these stereotypes. For example, Friedman et al. (2005) found that obese men and women who explicitly endorsed negative fat stereotypes reported greater body image distress than did those who did not endorse these stereotypes. Similarly, Durso and Latner (2008) found that greater explicit endorsement of fat stereotypes was related to greater body shape concerns in overweight and obese men and women. Further, Carels et al. (2010) found that greater implicit weight bias was related to lower body satisfaction in overweight and obese men and women.

The foregoing evidence indicates that endorsing fat stereotypes is associated with body dissatisfaction in overweight and obese individuals. However, few studies have investigated the association between fat stereotype endorsement and body dissatisfaction in average weight women. Further, investigations of this relationship tend to assess the specific fat stereotypes of willpower and controllability, which refer to the notion that one's weight is a matter of willpower and self-control. For example, Laliberte, Newton, McCabe, and Mills (2007) found that endorsing the belief that weight is completely controllable was related to higher body dissatisfaction in a predominantly normal weight sample of women. Participants with lower endorsement of this belief tended to report lower body dissatisfaction. Similarly, O'Brien, Hunter, Halberstadt, and Anderson (2007) found, in a predominantly normal weight sample of men and women, that greater endorsement of the stereotype that overweight people lack willpower was related to greater body image disturbance. Further, O'Brien, Hunter, and Banks (2006) found that



predominantly normal weight male and female physical education students with higher levels of implicit fat stereotypes reported significantly greater body dissatisfaction than did those with lower levels of implicit fat stereotypes. These same students also reported greater explicit endorsement of the willpower stereotype. It has been suggested that individuals who strongly believe that weight is completely controllable and is a matter of willpower likely feel dissatisfied with their own body because they feel responsible for their failure at maintaining an ideal weight (Laliberte et al., 2007). Because these ideals often are unattainable or difficult to maintain, belief in such stereotypes is thought to engender body dissatisfaction, even in normal weight women.

To expand upon this limited research base, a recent study by Kim and Jarry (2014) examined the relationship between fat stereotypes and body dissatisfaction in a sample of normal weight Caucasian women. In contrast to the studies described above, there was no significant relationship between fat stereotypes and body dissatisfaction in this sample ( $r = .06$ ). One notable difference in the Kim and Jarry (2014) study was the use of a measure assessing general fat stereotypes (e.g., laziness, uncleanness, unintelligence, lack of willpower), rather than a measure exclusively related to appearance-based stereotypes (e.g., unattractive). Thus, it appears that beliefs about general negative traits associated with overweight and obese individuals are not directly associated with body dissatisfaction in normal weight women. However, Kim and Jarry (2014) reported a subtler role for fat stereotypes in the body image of these women, discussed below.

### **Body Surveillance**

Though previous studies have investigated the relationship between fat

stereotypes and body image, little is known of the factors that impact this potential association. Kim and Jarry (2014), however, investigated body surveillance as a potential vulnerability factor. Though they did not find a direct relationship between fat stereotype endorsement and body dissatisfaction in their sample, the authors reported a moderating effect of body surveillance. Body surveillance refers to the tendency to view one's body from the perspective of an outside observer (Fredrickson & Roberts, 1997; McKinley & Hyde, 1996). In accordance with this definition, women with high body surveillance are those who report a greater tendency to look at and monitor their body frequently (McKinley, 1998; McKinley & Hyde, 1996). Further, women with high body surveillance are greatly concerned with how their body looks rather than how it feels (McKinley, 1998).

Gender differences in body surveillance have been examined. Though body surveillance is reported by both women and men, women consistently report higher levels than do men (e.g., Frederick et al., 2007; Lowery et al., 2005; McKinley, 1998). Further, women continue to show greater levels of body surveillance than do men as they age (McKinley, 2006). Notably, studies that consistently demonstrate moderate to high levels of body surveillance in women tend to use samples with an average body mass index (BMI) classified as normal weight (e.g., Brannan & Petrie, 2008; Fitzsimmons & Bardone-Cone, 2011; Greenleaf & McGreer, 2006; Sinclair & Myers, 2004). Further, Mercurio and Rima (2011) reported no relationship between BMI and body surveillance in a sample of undergraduate women. Accordingly, this research indicates that not only do women engage in body surveillance more frequently than do men, they do so regardless of their weight.

**Body surveillance and body dissatisfaction.** Kim and Jarry (2014) assessed body surveillance as a moderating factor in their study in part due to its documented relationship with body dissatisfaction. In general, the tendency to look at and monitor one's body frequently is thought to be harmful to body satisfaction in women. Body surveillance is theorized to lead to increased body dissatisfaction because it promotes an awareness of the discrepancy between one's own body and internalized cultural standards of attractiveness (McKinley & Hyde, 1996). Indeed, Brannan and Petrie (2008), as well as Mercurio and Rima (2011), observed a strong positive relationship between body dissatisfaction and body surveillance in women. Further, this relationship has been documented across different BMI categories. For example, Frederick et al. (2007) found that higher body surveillance was related to higher body dissatisfaction in normal weight, overweight, and obese women. Though the relationship was more pronounced in overweight and obese women, this finding supports that normal weight women who habitually monitor their body also tend to experience greater body dissatisfaction.

**Body surveillance and internalized thin ideals.** Researchers have investigated how the internalization of cultural body standards is related to body surveillance (McKinley & Hyde, 1996). In particular, this literature has focussed on internalized thin ideals, which refers to the extent to which an individual endorses societal portrayals of thinness as being the epitome of beauty (Thompson & Stice, 2001). For example, Fitzsimmons-Craft et al. (2012) investigated the relationships between body surveillance, internalized thin ideals, and body dissatisfaction in undergraduate women. Body surveillance was positively related both to internalized thin ideals and to body dissatisfaction. Similarly, Kim and Jarry (2014) reported strong positive relationships

between body surveillance and internalized thin ideals, and between body surveillance and body dissatisfaction, in their sample of normal weight undergraduate women.

As described, the literature on body surveillance has focussed on assessing its relationship with cultural ideals of thinness. Given the prevalence of fat stigma outlined above, however, it is possible that body surveillance plays a role in body dissatisfaction not only in individuals who internalize the ideal of thinness, but also in individuals who endorse the negative connotations characterized in fat stereotypes. Kim and Jarry (2014) argued that “body surveillance may further promote body dissatisfaction in women who endorse fat stereotypes by heightening their awareness of their own body fat, a characteristic that they denigrate” (p. 332). This seems especially likely, given that the desire to avoid being overweight may be more strongly related to negative body image than is the desire to achieve thinness (e.g., Dalley & Buunk, 2009; Woud, Anschutz, Van Strien, & Becker, 2011). Thus, Kim and Jarry (2014) suggested that women who habitually monitor their body and who also denigrate fat might be more susceptible to body dissatisfaction. Their close body monitoring may heighten awareness of unwanted fat on their body, especially if the latter is imbued with the negative meaning associated with fat stereotypes.

Based on this argumentation, Kim and Jarry (2014) hypothesized that the normal weight women who report higher fat stereotype endorsement as well as higher body surveillance would report the greatest body dissatisfaction. Contrary to predictions, however, the authors found that in normal weight women reporting higher levels of body surveillance, greater fat stereotype endorsement was related to *lower* body dissatisfaction, after accounting for the effect of internalized thin ideals. Thus, endorsing fat stereotypes

appeared to serve a defensive function against body dissatisfaction in normal weight women who habitually monitored their body. Further, in women reporting lower levels of body surveillance, greater fat stereotype endorsement was related to *higher* body dissatisfaction. Thus, for women who monitored their body less frequently, strongly endorsing fat stereotypes appeared to be detrimental to their body image. The authors purported that social comparison, specifically physical appearance comparison, could explain this paradoxical finding.

### **Social Comparison Theory**

The Social Comparison Theory states that people compare themselves to others in order to evaluate the self (Festinger, 1954). It also posits that people have an innate drive to evaluate various dimensions of the self (e.g., skills, attitudes, status). When objective means for self-evaluation are not possible, people will compare themselves to others to develop these evaluative judgments of the self (Festinger, 1954). Though it is considered a natural process in all humans, frequent engagement in social comparison tends to be related to negative factors across several domains. For example, a greater tendency to compare oneself to others is related to lower self-esteem, greater social anxiety, greater self-consciousness, and a greater tendency to engage in negative behaviours such as lying (Gibbons & Buunk, 1999).

Since its original conception, the construct of social comparison has been extended and now is believed to fulfill needs beyond merely self-evaluation. For example, people are believed to compare themselves to others for self-improvement or self-enhancement purposes (Buunk & Gibbons, 2007; Wood, 1989). Specifically, Wills (1981) extended the Social Comparison Theory by positing that comparing oneself to a

less fortunate other, termed downward comparison, can increase one's own subjective well-being. Wills (1981) also proposed that "downward comparison can be achieved through active derogation of another person, thereby increasing the psychological distance between the self and the [inferior] other" (p. 246). Conversely, comparing oneself to more fortunate others, termed upward comparisons, can decrease subjective well-being when the comparison promotes the contrast between oneself and the superior other (Wheeler, 1966; Collins, 1996).

Research has since shown that social comparisons in either direction can result in both positive and negative consequences (see Suls, Martin, & Wheeler, 2002, for a review). In other words, the direction of comparison itself is not directly related to subjective well-being. Rather, the resulting contrast or assimilation effect of the comparison dictates whether one will be impacted negatively or positively (Suls et al., 2002). Thus, comparisons in either direction can result in a heightened contrast effect, promoting the discrepancies between the self and the comparison target, or a heightened assimilation effect, promoting the similarities between the self and the comparison target (Suls et al., 2002). Stapel and Koomen (2000) suggested that two factors, distinctness and mutability, influence whether the social comparison process is more likely to result in a contrast effect or an assimilation effect. Distinctness refers to the extent to which a clear boundary is perceived between the self and the comparison target. Mutability, on the other hand, refers to the extent to which the perception of the self is vague and unclear. Based on these definitions, targets with distinct boundaries from the self, and self-views that are clear and immutable, are thought to produce larger contrast effects (Stapel & Koomen, 2000). Targets with indistinct or vague boundaries and self-views that are

mutable, however, are thought to produce larger assimilation effects.

Applying these concepts to directional social comparison processes allows for more specific hypotheses about their resulting effects on subjective well-being. Specifically, downward social comparisons in which the target is distinct and the self-view is clear are likely to result in greater well-being through a contrast effect that promotes the differences between the self and the inferior target. Downward social comparisons in which the target is indistinct and the self-view is mutable, however, are more likely to reduce well-being through an assimilation effect that promotes the similarities between the self and the inferior target. The opposite consequences for well-being are theorized for upward social comparisons. Upward social comparisons in which the target is distinct and the self-view is clear are likely to reduce well-being through a contrast effect that promotes the differences between the self and the superior target. Upward social comparisons in which the target is indistinct and the self-view is mutable are likely to increase well-being through an assimilation effect that promotes the similarities, or the possibility of similarities, between the self and the superior targets. These principles of social comparison have been applied in the area of body image, referred to as physical appearance comparison (Thompson, Heinberg, & Tantleff, 1991).

**Physical appearance comparison and body dissatisfaction.** Physical appearance comparison refers to the comparison of one's appearance to that of others (Thompson et al., 1991). Frequent engagement in physical appearance comparison is considered to be detrimental to one's body image. Indeed, the tendency to engage in physical appearance comparisons has been shown to relate to negative body image and disordered eating behaviours (e.g., Cattarin, Thompson, Thomas, & Williams, 2000;

Thompson et al., 1991). Myers and Crowther (2009) conducted a meta-analysis of 156 studies (189 effect sizes) and showed that greater engagement in physical appearance comparisons is related to higher body dissatisfaction.

Though physical appearance comparison has been assessed as a unitary concept in much of the literature, the “downward” and “upward” concepts recently have been applied to appearance-based comparisons. Specifically, downward appearance comparison has been described as comparing oneself to people who are perceived as less attractive, often including individuals considered overweight or obese (O’Brien et al., 2009). In contrast, upward appearance comparison involves comparing oneself to people perceived as more attractive, often including individuals who are thinner (O’Brien et al., 2009). As described by O’Brien et al. (2009), the underlying assumption of the physical appearance comparison research is that people tend to make upward physical appearance comparisons rather than downward comparisons, which leads to greater body discontent. In support of this notion, some research has shown that college women engage in more upward than downward physical appearance comparison (Tiggeman & Polivy, 2010). However, O’Brien et al. (2009) argue that given the different outcomes of upward and downward social comparison on well-being, it is likely that upward and downward physical appearance comparison have distinct effects on body image.

Despite the rationale for investigating the different roles of downward and upward physical appearance comparisons on body image, few studies have investigated their unique effects on appearance evaluation. Specifically, O’Brien et al. (2009) developed a measure assessing downward and upward physical appearance comparison separately. As expected, the authors found that greater engagement in downward physical appearance



comparison was related to more positive body image. Further, greater engagement in upward appearance comparison was related to more negative body image. Additionally, greater downward physical appearance comparison, but not upward physical appearance comparison, was related to stronger anti-fat attitudes (O'Brien et al., 2009). Similarly, Bailey and Ricciardelli (2010) found that more upward appearance comparisons and less downward appearance comparisons predicted higher body dissatisfaction and higher eating disturbance. Further, Leahey, Crowther, and Mickelson (2007) found that exposure to less attractive others, which likely leads to downward comparison, induced more positive self-evaluations. Interestingly, however, Vartanian and Dey (2013) found that both greater downward and upward physical appearance comparison were related to greater body dissatisfaction in undergraduate women. Further, these authors found that a weaker and unstable sense of self was related to greater engagement in both downward and upward physical appearance comparison. This points to the complex influence of physical appearance comparison on body satisfaction, suggesting that unidirectional comparisons may differentially influence body appraisals depending on other factors. In general, however, it is theorized that downward physical appearance is related to improvements in body satisfaction.

**Physical appearance comparison and body surveillance.** It is theorized that for women with high body surveillance, frequent comparison with other women could heighten their motivation to match their own body with cultural appearance ideals (Cahill & Mussap, 2007; Tylka & Sabik, 2010). Accordingly, physical appearance comparison also has been investigated in relation to body surveillance. Tylka and Sabik (2010) examined this relationship in a sample of college women. The authors found that body

surveillance positively predicted the tendency to engage in body-based comparisons. Similarly, Fitzsimmons-Craft et al. (2012) examined this relationship in undergraduate women. In accordance with the above study, these researchers found a significant positive relationship between body surveillance and the tendency to engage in physical appearance comparisons. These findings support the notion that higher body surveillance is associated with higher appearance comparison. One limitation noted in both studies, however, is that the measure of physical appearance comparison did not distinguish between upward or downward comparisons, and instead assessed physical appearance comparisons in general. To date, researchers have theorized that upward physical appearance comparison reminds women who have a greater tendency to monitor their body that they fall short of the internalized thin ideal. However, differential assessment of upward and downward comparisons is not commonly conducted in these studies. Thus, it is difficult to determine whether one or both directions of comparisons are related to body surveillance. Though it is highly likely that normal weight women who monitor their body frequently compare themselves to targets perceived to be more attractive, it also is possible that they compare themselves to targets perceived to be less attractive to improve their subjective appraisal of their appearance. This might be especially likely if they hold negative evaluations of overweight and obese individuals, a group often perceived as unattractive.

Taken together, this literature suggests that women with higher body surveillance are more likely to engage in physical appearance comparisons. Further, women who report greater comparisons with downward appearance targets also hold more negative evaluations toward obese individuals (O'Brien et al., 2009) and report greater body

satisfaction (Bailey & Ricciardelli, 2010), though there are some discrepant findings for the latter (Vartanian & Dey, 2013). Thus, in women with greater body surveillance, a tendency to hold negative beliefs about overweight individuals might lead to the engagement of downward physical appearance comparison with this target group, serving to improve body dissatisfaction. Further, the combination of varying levels of fat stereotypes and body surveillance may differentially influence downward comparison and, subsequently, body dissatisfaction, as described below.

**Proposed Model of Associations between Body Dissatisfaction, Fat Stereotypes, Body Surveillance, and Downward Physical Appearance Comparison**

Based on the reviewed literature, the unexpected effect reported by Kim and Jarry (2014) could be explained through differential downward physical appearance comparisons. The proposed conceptual mediated moderation model is presented in Figure 1. In this model, it was predicted that body surveillance moderates the relationship between fat stereotypes and body dissatisfaction, and that this moderation is mediated by downward physical appearance comparison. The theoretical explanations of the proposed relationships are as follows.

**Higher fat stereotypes and higher body surveillance.** Normal weight women with higher body surveillance and who also strongly endorse fat stereotypes may be most likely to engage in downward appearance comparisons against larger people perceived to be less attractive. Using Stapel and Koomen's (2000) social comparison concepts outlined above, these women likely have clear and immutable self-views, given their tendency to closely monitor their body. Further, they may perceive overweight and obese individuals as distinct targets, given their fat stereotype endorsement, creating conditions

favourable for a contrast effect. The distance thus created between the self and the physically derogated group may serve to improve their appraisal of their own body. Although they may notice parts of their body with which they are dissatisfied (Mercurio & Rima, 2011), their body image could be protected by the fact that their body does not match the negatively stereotyped body of larger individuals, their comparison target. In other words, their higher appearance monitoring may be promoting a contrast between themselves and the larger people whom they judge negatively through engagement in downward appearance comparisons, thus enhancing their own body satisfaction.

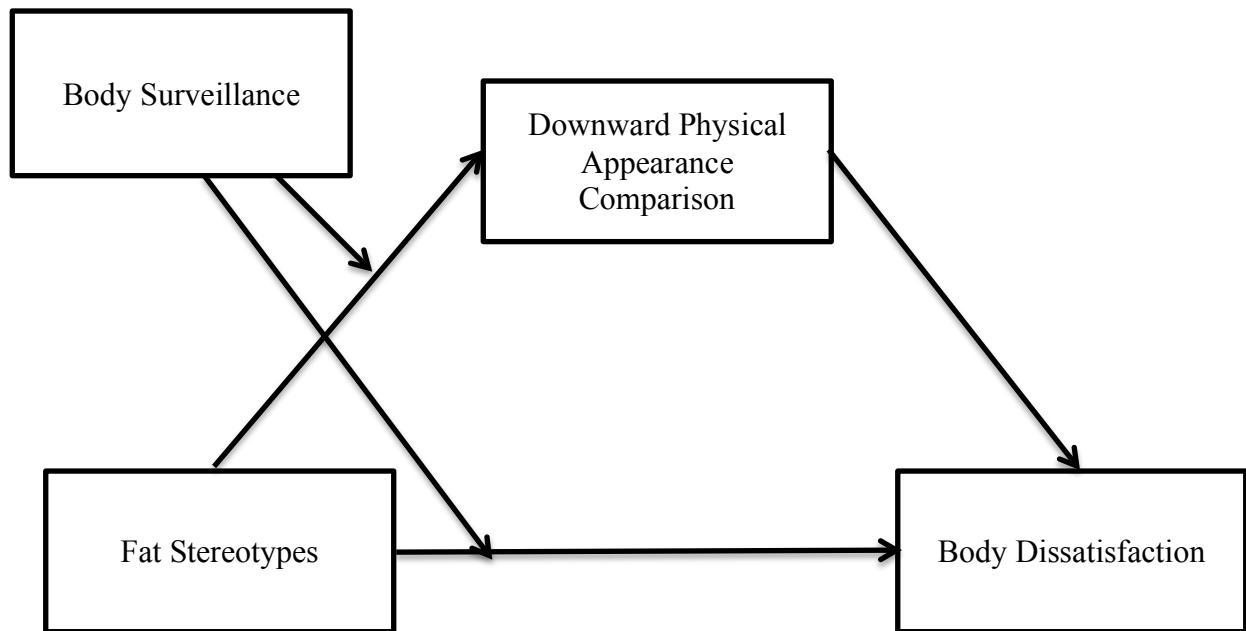


Figure 1. Proposed conceptual mediated moderation model.

**Lower fat stereotypes and higher body surveillance.** In contrast, normal weight women who have a higher tendency to monitor their body but who do not strongly endorse fat stereotypes may be less likely to engage in downward appearance comparisons with overweight and obese individuals because of their lower derogation of this group. Though they may have clear and immutable self-views, the targets of comparison may be less distinct from the self because of their lower fat stereotypes, creating less favourable conditions for a pronounced contrast effect. Their lower level of downward comparison may result in less self-enhancement due to the weaker salience of the discrepancy between themselves and obese individuals, hence their higher reported body dissatisfaction. Therefore, women who report higher body surveillance and who hold less fat stereotypes may not be protected by the contrast effects of downward comparison. Further, in comparison to women with high surveillance and high fat stereotypes, assimilation effects rather than contrast effects may occur when these women do engage in downward comparison due to the indistinct boundaries between themselves and the comparison targets. Finally, these women may be acutely focussed on aspects of their body with which they are dissatisfied. The combination of less downward appearance comparison with large people and the internalization of a thin ideal that they are unlikely to match may create conditions favourable to the development of body dissatisfaction in this group of women.

**Higher fat stereotypes and lower body surveillance.** Normal weight women who report lower levels of body surveillance, however, appear to be affected negatively by holding fat stereotypes (Kim & Jarry, 2014). In lower surveillance women, greater endorsement of fat stereotypes was associated with more body dissatisfaction. Given their

lower focus on their body, these women may be less likely to engage in downward physical appearance in comparison to women with high body surveillance (Tylka & Sabik, 2010). Because of their fat stereotypes, however, they are more likely to engage in downward comparison than are women with low surveillance and low fat stereotypes. Further, because these women do not tend to monitor and examine their body frequently, they may have mutable and vague self-views, creating conditions favourable for an assimilation effect rather than a contrast effect when they do engage in downward comparison. As such, the discrepancy between themselves and obese individuals may be less salient to them, and they may actually focus on the similarities between themselves and the target group that they denigrate. This would generate greater dissatisfaction with their own body. It is notable, however, that these women still report lower body dissatisfaction than do women who engage in higher body surveillance, regardless of the latter's degree of fat stereotype endorsement.

**Lower fat stereotypes and lower body surveillance.** Finally, normal weight women with lower levels of body surveillance and lower endorsement of fat stereotypes appear to be the least dissatisfied with their body (Kim & Jarry, 2014). These women may be the least likely to engage in downward appearance comparison by virtue of their low fat stereotype endorsement and low body surveillance, and therefore may be less aware of the discrepancy between themselves and obese individuals. However, this may not harm their body satisfaction because they also hold less negative judgments about larger bodies. Overall, these women appear to be the least concerned about their appearance.

The current research sought to integrate these theoretical explanations into a proposed mediated moderation model. It was expected that downward physical appearance comparison in particular would be the mechanism through which the interaction between fat stereotype endorsement and body surveillance influences body dissatisfaction. Because upward physical appearance comparison against obese targets is unexpected (O'Brien et al., 2009), the proposed research did not examine the impact of this directional comparison as a mediating variable. Based on the theoretical explanations outlined above, it was expected that this interaction between fat stereotyping and body surveillance would influence one's tendency to engage in downward appearance comparison, which in turn, would impact body dissatisfaction. In summary, women with higher body surveillance and higher fat stereotypes were predicted to engage most extensively in downward comparison, with a resulting contrast effect leading to lower body dissatisfaction. Women with lower body surveillance were expected to engage in relatively less downward comparison, but with a resulting assimilation effect when they also endorsed high fat stereotypes. Finally, it was expected that the overall effect of downward comparison on body dissatisfaction would be most influenced by women with higher body surveillance and higher fat stereotypes, indicating a negative relationship between these two variables.

### **Influence of Race and Ethnicity on Body Image and Weight-Bias**

Finally, among the important factors to consider when investigating body image and fat stereotypes are race and ethnicity. Previous studies have indicated that both body image and weight bias vary significantly across different racial and ethnic groups. Indeed, Kim and Jarry (2014) reported that while their moderated effect was significant in their



Caucasian sample of undergraduate women, it was not significant in the ethnically heterogeneous sample. The research on the influence of race and ethnicity on weight bias and body image is summarized below.

Studies have shown differential levels of weight-bias across racial groups. For example, Latner et al. (2005) examined obesity stigma in African American, Asian, Hispanic, and White college students. These researchers found that compared to individuals with visible disabilities such as being in a wheelchair, individuals with obesity were stigmatized strongly across all racial groups. However, in this same study, both African American and Asian women reported greater liking for obese individuals than did White women. In contrast, no difference in liking for obese individuals was reported between Hispanic and White women. Hebl, King, and Perkins (2009) reported similar findings between Black and White women. These researchers found that Black women self-reported lower anti-fat attitudes and greater positive attitudes toward pictures of obese individuals than did White women. Additionally, Greenleaf, Chambliss, Rhea, Martin, and Morrow (2006) examined weight stigma in White and Hispanic adolescents ranging in age from 11 to 16 years. Using a self-report measure assessing fat stereotypes, such as the beliefs that larger individuals are unhappy, sloppy, or greedy, no differences in endorsement were reported across the two groups. Further, both Hispanic and White participants reported lower willingness to engage in social, academic, and recreational activities with an obese individual than with a thin individual. These findings suggest that when examining variables related to weight bias such as fat stereotyping, it is important to account for race and ethnicity. Analyses conducted on racially and ethnically mixed samples may mask the attitudes of each of these subgroups toward overweight and obese

individuals.

In addition to weight bias, racial differences in body dissatisfaction have been documented. For example, Akan and Grilo (1995) assessed body dissatisfaction in African American, Asian American, and Caucasian undergraduate students. Caucasian participants reported greater levels of body dissatisfaction than did both Asian American and African American participants. In contrast, Asian American and African American participants reported similar levels of body dissatisfaction. Interestingly, a history of weight-related teasing was related to body dissatisfaction both in African American and Caucasian American participants, but not in Asian American participants. This suggests that even across races reporting similar levels of body satisfaction, such as Asian American and African American, differences in the relationships between body satisfaction and weight-related constructs exist. Indeed, the results of the Kim and Jarry (2014) study showed that body surveillance moderated the relationship between fat stereotype endorsement and body dissatisfaction in Caucasian normal weight women only. This association disappeared when non-Caucasian women were integrated in the sample for analyses. Further, a meta-analysis found that across 98 studies, Caucasian women tend to report greater body dissatisfaction than do Hispanic and Black women, and that Hispanic women tend to report greater body dissatisfaction than do Black women (Grabe & Hyde, 2006). Additionally, this meta-analysis found that Asian women do not report significantly different levels of body dissatisfaction compared to Black, Caucasian, or Hispanic women (Grabe & Hyde, 2006).

Because the sample sizes of minority groups were limited, Kim and Jarry (2014) could not assess for racial/ethnic differences in body dissatisfaction or weight bias.

However, their findings supported the notion that race continues to play an important role in body image research. To follow up on these findings, the main analyses of the current research were conducted on Caucasian normal weight women. Data also were collected from participants of other races and ethnicities to conduct additional analyses examining the same mediated moderation model in an ethnically heterogeneous sample.

### **Overview of Two Studies**

The goal of this research was to extend the knowledge on the impact of fat stereotypes and body surveillance in normal weight women. Using two studies, the research built upon Kim and Jarry's (2014) findings by examining downward physical appearance comparison as the mechanism through which the interaction between fat stereotype endorsement and body surveillance influences body dissatisfaction. The proposed research also examined the causal role of fat stereotype endorsement in the mediated moderation model.

The first study utilized self-report measures of fat stereotype endorsement, body surveillance, downward physical appearance comparison, and body dissatisfaction to test the proposed mediated moderation model. In addition to these variables, BMI (Frederick et al., 2007), global self-esteem (Lowery et al., 2005), and depressive symptoms (Wiederman & Pryor, 2000) were considered as potential covariates because of their consistent relationship with body dissatisfaction in women. Further, social desirability was assessed as a potential covariate, given its negative relationship both with body dissatisfaction (Brannan & Petrie, 2008) and self-reported weight bias (Perez-Lopez, Lewis, & Cash, 2001). Finally, given the well-documented relationships between internalized thin ideals with body dissatisfaction (Thompson & Stice, 2001) and body

surveillance (Fitzsimmons-Craft et al., 2012), thin ideal internalization was controlled in the analyses. This ensured that the proposed mediated moderation model was examined above and beyond the critical effect of the thin ideal.

In the second study, an experimental design was used to examine the same proposed model. The model suggests that fat stereotyping has a potential causal role in the experience of body dissatisfaction, albeit indirectly. If holding fat stereotypes truly protects against body dissatisfaction in normal weight women with higher body surveillance, experimentally increasing endorsement of fat stereotypes should result in lower body dissatisfaction. Further, experimentally increasing endorsement was expected to result in higher body dissatisfaction in women with lower body surveillance, given the explanations described above. In this study, participants first completed a demographic questionnaire and measures of body surveillance, internalized thin ideals, trait self-esteem, depressive symptoms, and socially desirable responding. As in the first study, the latter three measures were assessed as potential covariates. Participants then were randomly assigned either into a condition intended to increase fat stereotype endorsement by presenting information that supports these stereotypes (support condition), or to a condition intended to decrease fat stereotype endorsement by presenting information that challenges these stereotypes (challenge condition). These conditions are described in detail below. Then, participants completed measures of state body dissatisfaction, state downward physical appearance comparison, and endorsement of fat stereotypes.

It was planned that Study 2 would be conducted to assess the potential causal impact of manipulating fat stereotypes, even if predicted effects were not found in Study 1. Several studies have examined the effectiveness of weight bias reduction programmes,

and the resulting impact on attitudes and discriminatory behaviour against overweight and obese individuals (Dánielsdóttir, O'Brien, & Ciao, 2010). These studies, however, have not investigated the impact of weight bias reduction on appraisals of one's body, or on the tendency to compare one's body to that of overweight and obese individuals. If the latter were found, this would be an additional potential benefit of weight-bias reduction programmes by decreasing the likelihood of women disparaging others to increase their own body satisfaction. The details of the two studies are presented below.

## Chapter II

### Study 1

#### **Purpose and Hypotheses**

The first purpose of Study 1 was to replicate the moderation effect reported by Kim and Jarry (2014). Body surveillance was predicted to moderate the relationship between fat stereotype endorsement and body dissatisfaction. The second purpose of Study 1 was to extend the findings reported by Kim and Jarry (2014) by examining downward physical appearance comparison as an explanation for this moderated effect. In other words, downward physical appearance comparison was expected to be the mechanism through which the interaction between fat stereotype endorsement and body surveillance impacts body dissatisfaction. The specific hypotheses for Study 1 are outlined below:

1. The relationship between fat stereotype endorsement and body dissatisfaction will be moderated by body surveillance in normal weight women. Specifically, for normal weight women with higher levels of body surveillance, higher fat stereotype endorsement will be related to lower body dissatisfaction (i.e., a

negative relationship). Conversely, for normal weight women with lower levels of body surveillance, higher fat stereotype endorsement will be related to higher body dissatisfaction (i.e., a positive relationship).

2. This moderated effect will be mediated by downward physical appearance comparison. Specifically, the interaction between fat stereotypes and body surveillance will predict downward physical appearance comparison, such that at higher levels of body surveillance, greater fat stereotype endorsement will be related to greater downward comparison. At lower levels of body surveillance, greater fat stereotypes also will be related to greater downward comparison, but to a lesser degree than in the high surveillance women. Finally, greater downward comparison is expected to predict lower body dissatisfaction while controlling for the interaction between fat stereotypes and body surveillance, thus completing the mediated moderation model.

### **Study 1: Method**

#### **Participants**

Participants were recruited from the Psychology Participant Pool at the University of Windsor and received 0.5% course credit for their participation. Because the Participant Pool did not include the function of calculating BMI based on weight and height, screening based on BMI was not possible through the pool and the study was made available to all women registered in the pool. Instead, self-reported weight and height information was requested in the study demographics questionnaire, and was used to calculate BMI by the researcher. Previous studies have indicated that although female college students tend to underestimate their weight and overestimate their height, BMI

calculations based on this self-reported information are highly specific in identifying people of normal weight (e.g., Larsen et al. 2008; Brener et al., 2003). Notably, Larsen et al. (2008) reported that 98.9% of normal weight women were correctly identified based on self-reported weight and height. Further, Larsen et al. (2008) reported a correlation of  $r = .94$  between self-reported and objective BMI. Finally, past studies consistently indicate that inaccuracies in self-reported weight information are a greater concern at higher BMIs (e.g., Larsen et al., 2008; Cash et al., 1992; McCabe et al., 2001). Based on this information, it was assumed that self-reported weight and height information could be used reliably to calculate BMI. Analyses were conducted only on participants with a BMI between 18.5 to 25 kg/m<sup>2</sup>. Additionally, main analyses were conducted on Caucasian participants only, though additional analyses were conducted on the full, ethnically heterogeneous sample.

Data were collected from a total of 654 participants. Of these participants, 404 were normal weight. The mean age of participants was 19.91 years ( $SD = 2.59$ ) and their mean self-reported BMI was 21.65 kg/m<sup>2</sup> ( $SD = 1.67$ ). Self-reported race and ethnicity were as follows: 76.0% Caucasian ( $n = 307$ ), 7.7% Arab or West Asian, 6.7% South Asian, 4.0% African Canadian, 3.2% East Asian, 0.5% South American, 0.2% Native Canadian, and 1.8% reported two or more ethnic backgrounds. Further, 93.6% reported no lifetime diagnosis of an eating disorder, 5.9% reported having been diagnosed previously, and 0.5% did not report if they had ever been diagnosed with an eating disorder.

In terms of years of university education, 22.5% were in their first year, 30.7% were in their second year, 24.5% were in their third year, 17.3% were in their fourth year,

and 4.7% had attended university for more than four years. Additionally, 49.1% of participants were psychology majors. In terms of current employment status, 65.3% were employed part-time, 32.4% were unemployed, and 2% were employed full-time.

### **Measures**

**Predictor variable.** The Obese Persons Trait Survey (OPTS; Puhl, Schwartz, & Brownell, 2005; Appendix A) is a 20-item self-report measure that assesses endorsement of traits associated with obese persons. The OPTS consists of two subscales. The OPTSneg measures endorsement of negative stereotypes and lists 10 negative traits, such as laziness. The OPTSpos measures positive stereotypes and lists 10 positive traits, such as generous. Participants are asked to estimate the percentage (0-100%) of obese persons who possess each of these traits. Although the entire scale was administered in this study to maintain psychometric properties, only the OPTSneg subscale was used in the analyses. Based on the method described by Carels et al. (2010), participants also were asked to estimate the percentage of average weight persons who possess the same 20 traits. The Average-Weight Persons Trait survey (APTS) consists of both the negative (APTSneg) and positive (APTSpos) subscales, but only the APTSneg was used in the analyses. To obtain an indicator of the extent to which participants endorsed fat stereotypes, mean percentage estimates of negative traits for average weight persons were subtracted from mean estimates for obese persons. Higher positive difference scores indicate stronger fat stereotype endorsement. The OPTSneg has demonstrated convergent validity with a measure of anti-fat attitudes (Domoff et al., 2012). Additionally, the OPTSneg has demonstrated acceptable to good internal consistency, with Cronbach's alpha ranging from .73 to .88 (Carels et al., 2009; Carels et al., 2010; Gumble & Carels,



2012; Puhl et al., 2005). The APTSneg also has demonstrated excellent internal consistency,  $\alpha = .90$  (Carels et al., 2010). In the current study, the OPTSneg and APTSneg both had good internal consistency, with  $\alpha = .84$  and  $\alpha = .84$ , respectively.

**Moderator variable.** The Objectified Body Consciousness Surveillance Subscale (OBCSS; McKinley & Hyde, 1996; Appendix B) is an 8-item self-report measure that assesses the tendency to engage in body surveillance, or to closely examine one's body. Participants respond on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A sample item is "During the day, I think about how I look many times." Higher scores indicate greater body surveillance. Internal consistencies for the OBCSS have ranged from .81 to .89 in past research (Brannan & Petrie, 2008; McKinley & Hyde, 1996). This subscale also has demonstrated convergent validity with a measure of appearance orientation ( $r = .64$ ; McKinley & Hyde, 1996). In the current study, the OBCSS had good internal consistency,  $\alpha = .84$ .

**Mediator variable.** The Downward Physical Appearance Comparison (DPACS) (O'Brien et al., 2009; Appendix C) is an 8-item self-report measure that assesses the tendency to compare oneself with targets perceived as less physically attractive. Participants respond on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A sample item is "I often compare myself to those who are less physically attractive." Higher scores indicate greater downward appearance comparison. The DPACS has demonstrated excellent internal consistency in past research ( $\alpha = .90$ ; O'Brien et al., 2009). This subscale also has demonstrated convergent validity with a measure of general body comparison ( $r = .50$ ; O'Brien et al., 2009). In the current study, the DPACS had excellent internal consistency,  $\alpha = .95$ .

**Criterion variable.** The Eating Disorder Inventory-2 Body Dissatisfaction subscale (EDI-BD; Garner, 1991; Appendix D) is a 9-item self-report measure that assesses women's body dissatisfaction. Participants respond on a 6-point scale ranging from 1 (*never true*) to 6 (*always true*). A sample item is "I think my stomach is too big." Higher scores indicate greater body dissatisfaction. The EDI-BD has demonstrated excellent internal consistency in past research, with alphas ranging from .89 to .91 (Brookings & Wilson, 1994; Tylka, 2004). Further, the EDI-BD has demonstrated convergent validity with other measures of body dissatisfaction, such as the Body Shape Questionnaire ( $r = .82$ ; Garner, 1991). In the current study, the EDI-BD had excellent internal consistency,  $\alpha = .90$ . To check whether participants were simply clicking through the questions without reading them, an additional item was added to the end of the EDI-2 asking participants to select the response "Usually."

**Covariates.** The Sociocultural Attitudes Toward Appearance Scale-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004; Appendix E) is a 30-item self-report measure of societal influences on body image. The SATAQ-3 consists of four subscales, one of which is the Internalization General subscale (SATAQ-IG). The SATAQ-IG consists of 9 items that assess internalization of thin ideals. Participants respond on a 5-point scale ranging from 1 (*definitely disagree*) to 5 (*definitely agree*). A sample item is "I compare my body to the bodies of people who are on TV." Higher scores indicate greater internalization of thin ideals. The SATAQ-IG has demonstrated excellent internal consistency in past research,  $\alpha = .92$  (Thompson et al., 2004). It also has demonstrated good convergent validity with the Drive for Thinness subscale of the

Eating Disorder Inventory ( $r = .57$ ; Thompson et al., 2004). In the current study, the SATAQ-IG had excellent internal consistency,  $\alpha = .94$ .

The Beck Depression Inventory-II (BDI-II; Beck, Steer, Ball, & Ranieri, 1996; Appendix F) is a 21-item self-report measure of depressive symptomatology. Participants respond on a 4-point scale ranging from 0 (absence of symptom; e.g., “I do not feel sad”) to 3 (severe presence of symptom; e.g., “I am so sad or unhappy that I can’t stand it”). Higher scores indicate greater severity of depressive symptoms. The BDI-II has demonstrated excellent internal consistency in past research,  $\alpha = .92$  (Beck et al., 1996). Osman et al. (1997) also demonstrated adequate convergent validity between the BDI-II and other measures of depression ( $r = .77$ ) and anxiety ( $r = .71$ ). In the current study, the BDI-II had excellent internal consistency,  $\alpha = .93$ . To check whether participants were simply clicking through the questions without reading them, an additional item was added to the end of the BDI-II asking participants to select the response “0.”

The Marlowe-Crowne Social Desirability Scale Form C (MCSDS-C; Reynolds, 1982; Appendix G) is a 13-item self-report measure of the tendency to respond to test items in a socially desirable manner. Participants indicate whether items are true or false for them personally. A sample item is “It is sometimes hard for me to go on with my work if I am not encouraged.” Higher scores indicate greater socially desirable responding. The MCSDS-C has demonstrated adequate internal consistency in past research ( $r_{KR-20} = .76$ ; Reynolds, 1982). The MCSDS-C also has demonstrated convergent validity with other measures of social desirability, including the Edwards Social Desirability Scale ( $r = .41$ ; Reynolds, 1982). In the current study, however, the MCSDS-C had an internal consistency of  $r_{KR-20} = .68$ . Given the low reliability, analyses were

conducted with and without the MCSDS-C. The MCSDS-C was excluded from final analyses because it did not significantly contribute to the regression models.

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965; 1979; Appendix H) is a 10-item self-report measure of global trait self-esteem. Participants respond on a 4-point scale ranging from 0 (*strongly disagree*) to 3 (*strongly agree*). A sample item is “I feel that I have a number of good qualities.” Higher scores indicate greater self-esteem. The RSES has demonstrated excellent internal consistency,  $\alpha = .92$  (Rosenberg, 1979). The RSES also has demonstrated convergent validity with other measures of self-esteem, including the Coopersmith Self-Esteem Inventory ( $r = .55$ ; Demo, 1985). In the current study, the RSES had good internal consistency,  $\alpha = .89$ . To check whether participants were simply clicking through the questions, an additional item was added to the end of the RSES asking participants to select the response “disagree.”

A demographic questionnaire (Appendix I) was used to obtain general demographic information, such as age and total years of university education. This questionnaire also asked for weight and height information to determine each participant’s BMI. Body mass index was calculated by dividing each participant’s weight (in kilograms) by her height (in metres squared). Participants who did not provide weight and height information were omitted from the analyses.

## **Procedure**

Study 1 was advertised on the Psychology Participant Pool as a study examining “Individual Differences and Perceptions of People” (see Appendix J for pool advertisement). After signing up for the study, participants were provided with a link to the FluidSurvey webpage. This webpage requested informed consent (Appendix K) for

participation, prior to the administration of the measures. Participants were encouraged to complete the study in a quiet area free from distractions. Consenting participants were directed to electronic forms of the questionnaires used in the study. The presentation order of the measures was as follows: OPTS, BDI-II, OBCSS, MCSDS-C, DPAC, RSES, SATAQ-IG, EDI and the demographic questionnaire. This order of presentation alternated body image variables with non-appearance related variables. Upon completion of the measures, participants were directed to a debriefing page (Appendix L), which explained the purpose of the study and thanked them for their time and contribution. Finally, participants received a 0.5% bonus credit toward an eligible psychology course of their choice.

## **Study 1: Results**

### **Approach to Data Analysis**

All analyses were performed using SPSS for Mac (Version 25.0). Missing values and reliability analyses were conducted. Assumptions of multiple regression were assessed, followed by descriptive analyses. Finally, all of the hypotheses were tested using a series of multiple regression analyses using the Hayes (2017) PROCESS macro for SPSS. These steps were conducted first for the Caucasian-only sample, and then repeated for the full ethnically heterogeneous sample. Because of the limited sample size, separate analyses could not be conducted on women of non-Caucasian ethnicities.

### **Main Analyses for Caucasian-Only Sample**

**Data preparation.** Of the normal weight participants who completed the study, 307 self-identified as Caucasian. The validity indicators first were checked to ensure that only data for participants who were attentive to the questionnaire items were included in

the analyses. Participants who failed more than one of the validity indicators (i.e., failed to select the correct response on an item added to the EDI-2, BDI-II, and RSES;  $n = 3$ ) were not included in the analyses. After removing these three participants, as well as three identified outliers (see Assumptions section below), the total Caucasian sample size for this study was 301 participants.

A missing values analysis was conducted on data from valid responders to assess for patterns of missingness. Seventy-nine percent ( $n = 240$ ) of participants provided complete data. The percentage of missing values for all measure items ranged from 0 to 3.0%. Finally, less than 1% of all possible values were missing. Little's MCAR test was not significant,  $\chi^2(3922) = 3915.63, p = .526$ , indicating that the data were missing completely at random. This supported the use of imputation as an appropriate method of managing the missing data (Schafer & Graham, 2002). Expectation maximization was used to replace missing values, given the small amount of missing data (Tabachnick & Fidell, 2007).

**Assumptions of multiple regression.** The assumptions for multiple regression were examined according to the procedures outlined by Field (2009) and Tabachnick and Fidell (2007). The assumption of the absence of multicollinearity was assessed by examining correlations between variables, and checking variance inflation factors (VIF). This assumption was satisfied as none of the variables had correlations above  $|.69|$  (see Table 1 for all zero-order correlations), and none of the VIF values approached the cutoff of 10 (Cohen et al., 2003). To assess the assumption of independence of errors, the Durbin-Watson statistic was examined and was close to the acceptable value of 2 (Field,

2009). Further, data were collected cross-sectionally, and there was no relationship between participants (Field, 2009). Accordingly, independence of errors was assumed. Next, the assumptions of normally distributed errors, homoscedasticity, and linearity were assessed. For each regression, the scatterplot of standardized residual versus standardized predicted outcome appeared as a cloud, with an even concentration of scores around the centre. Furthermore, the scatterplot did not appear to have a wave or funnel pattern. Thus, linearity and homoscedasticity were assumed. Additionally, the histograms of standardized residuals approximated the normal curve, and the Shapiro-Wilk's statistic for the standardized residuals was not significant,  $SW(301) = .993, p = .180$ . Thus, normal distribution of errors was assumed.

Table 1

*Zero-Order Correlations Between All Variables for Caucasian Sample (N = 301).*

Variables	1	2	3	4	5	6	7	8	9	10
1. MCSDS-C	-									
2. RSES	.21**	-								
3. BDI-II	-.23**	-.69**	-							
4. BMI	.01	-.07	.04	-						
5. SATAQ-IG	-.25**	-.33**	.29**	.07	-					
6. OPTSneg	-.12*	-.04	.05	-.01	.15*	-				
7. APTSneg	-.04	-.00	.07	-.03	.05	.26**	-			
8. OBCSS	-.29**	-.34**	.25**	.13*	.58**	.14*	-.01	-		
9. DPACS	-.29**	-.19**	.23**	.10	.50**	.23**	.09	.36**	-	
10. EDI-BD	-.21**	-.52**	.49**	.29**	.53**	.11	.03	.50**	.32**	-

*Note:* \*  $p < .05$ , \*\*  $p < .01$ ; MCSDS-C = Marlowe Crowne Social Desirability Scale Form C; RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OPTSneg = Obese Persons Trait Survey negative traits; APTSneg = Average-Weight Persons Trait Survey negative traits; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; DPACS = Downward Physical Appearance Comparison Scale; EDI-BD = Eating Disorders Inventory 2 Body Dissatisfaction subscale



Tabachnick and Fidell (2007) recommend assessing univariate normality for each predictor. Based on the *SW* statistic, six predictors were not normally distributed. Thus, a transformation was applied to each predictor. However, these transformations did not reduce the *SW* statistics to non-significance, nor did they significantly change the results of the final regression model (i.e., variables included in the final model,  $R^2$ , regression coefficients, significance values, etc.). Because the assumptions of homoscedasticity, linearity, and normally distributed errors had been satisfied, and because predictor variables are not assumed to be normally distributed in multiple regression, the non-transformed predictor variables were used in the main analyses (Tabachnick & Fidell, 2007).

Finally, the data were examined for univariate outliers, residual outliers, multivariate outliers, and influential cases. Three univariate outliers were identified (2 on BDI and 1 on OPTSneg), and were replaced with the next closest value in the dataset (Tabachnick & Fidell, 2007). Residual outliers were identified using standardized residual values, and multivariate outliers were identified using both Mahalanobis distance and leverage values. Three multivariate outliers were removed from all analyses. Influential cases were examined using both Cook's distance and DFFITS values. After removing outliers in all regression analyses, no influential cases were identified.

Structure coefficients were examined for all variables included in the final regressions (Courville & Thompson, 2001). The directional signs for all significant regression coefficients were the same as those for the corresponding structure coefficients. Additionally, all predictor variables that significantly contributed to the final

model also were significantly correlated with the predicted outcome. Thus, no suppressor variables were identified in the final models presented below.

Means and standard deviations for all variables are presented in Table 2. To ensure specificity of the measure of fat stereotypes, the mean of the estimated percentages of obese persons who possess negative traits (OPTSneg) was compared to the mean of the estimated percentages of average-weight persons who possess the same negative traits (APTSneg). A paired samples *t*-test found that participants estimated significantly greater percentages of obese persons possessing the negative traits than they did for average-weight persons possessing the same negative traits,  $t(300) = 12.96, p < .001$ . Cohen's *d* for this difference was .75, indicating a large effect.

**Moderation analysis for body dissatisfaction.** The first multiple regression assessed Hypothesis 1, with body dissatisfaction as the criterion variable. The PROCESS macro for Model 1 was used, as it examines potential moderation effects (Hayes, 2012). In this regression, self-esteem, depressive symptomatology, and BMI were included as significant covariates. Additionally, internalization of thin ideals was included to ensure that any observed effects of endorsed fat stereotypes and body surveillance on body dissatisfaction occurred above and beyond the effect of thin ideals. Fat stereotype endorsement was included as the independent variable, and body surveillance was entered as the moderator variable. The interaction term between fat stereotype endorsement and body surveillance was then computed using the PROCESS macro. To aid interpretation, the predictor and moderator variables were centered prior to calculating the interaction term (Cohen et al., 2003).

Table 2

*Descriptive Statistics for Caucasian Sample (N = 301)*

Variable	N	Range	M	SD	Cronbach's $\alpha$
MCSDS-C	301	0.00 – 12.00	5.47	2.77	.677 <sup>1</sup>
RSES	301	4.00 – 30.00	19.58	5.23	.890
BDI-II	301	0.00 – 49.00	13.86	10.49	.933
BMI	301	18.5 – 24.9	21.71	1.68	-
SATAQ-IG	301	1.00 – 5.00	3.13	1.00	.940
OPTSneg	301	17.00 – 91.00	58.37	12.63	.839
APTSneg	301	14.30 – 76.32	47.83	10.35	.837
OBCSS	301	1.50 – 7.00	4.72	1.06	.835
DPACS	301	1.00 – 5.00	2.86	1.05	.947
EDI-BD	301	9.00 – 54.00	30.87	9.45	.895

*Note:* <sup>1</sup> denotes a KR-20 value of internal consistency. MCSDS-C = Marlowe Crowne Social Desirability Scale Form C; RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OPTSneg = Obese Persons Trait Survey negative traits; APTSneg = Average-Weight Persons Trait Survey negative traits; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; DPACS = Downward Physical Appearance Comparison Scale; EDI-BD = Eating Disorders Inventory 2 Body Dissatisfaction subscale

Table 3 provides a summary of the final model. The model was significant,  $F(7, 293) = 46.22, p < .001$ , accounting for 52.47% of the variance in body dissatisfaction. All covariates significantly contributed to the model (all  $ps < .003$ ). As expected, endorsement of fat stereotypes did not significantly contribute to the model,  $b = 0.02, t(300) = 0.75, p = .457$ . However, body surveillance was a significant predictor,  $b = 1.64, t(300) = 3.59, p = <.001$ . Finally, adding the interaction term significantly improved the prediction of body dissatisfaction,  $F_{\text{change}}(1, 293) = 4.85, p = .028$ , accounting for an additional 0.79% of the variance. As predicted, the interaction between fat stereotype endorsement and body surveillance significantly contributed to the model,  $b = -.05, t(300) = -2.21, p = .028$ . Because the interaction was significant, the specific effect of fat stereotypes on body dissatisfaction at varying levels of body surveillance was examined (see Table 4). Greater endorsement of fat stereotypes was significantly related to greater body dissatisfaction in women who reported lower levels of body surveillance (1 *SD* below the mean),  $t(300) = 1.97, p = .049, 95\% \text{ CI } [.001, .156]$ . In contrast, endorsement of fat stereotypes was not significantly related to body dissatisfaction in participants who reported higher levels of body surveillance (1 *SD* above the mean),  $t(300) = -1.03, p = .302, 95\% \text{ CI } [-.108, .034]$ . Accordingly, Hypothesis 1 was partially supported. The interaction between endorsed fat stereotypes and body surveillance significantly predicted body dissatisfaction (see Figure 2). At lower levels of body surveillance, greater fat stereotyping predicted higher body dissatisfaction. Contrary to the hypothesis, however, fat stereotyping did not significantly predict body dissatisfaction at higher levels of body surveillance. Notably, body surveillance levels at 1 *SD* above and below the mean in this sample were comparable to the levels reported by Kim and Jarry (2014).

Table 3

*Moderation Model Summary Predicting Body Dissatisfaction for Caucasian Sample (N = 301)*

<i>R</i>	<i>R</i> <sup>2</sup>	Variables Entered	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>p</i> -value	95% CI	
							Lower Limit	Upper Limit
.724	.525	Constant	1.80	6.40	0.28	.778	-10.79	14.39
		RSES	-0.32	0.10	-3.11	.002	-0.53	-0.12
		BDI-II	0.22	0.05	4.36	<.001	0.12	0.32
		BMI	1.28	0.23	5.60	<.001	0.83	1.73
		SATAQ-IG	2.52	0.48	5.30	<.001	1.58	3.46
		OPTSneg	0.02	0.03	0.75	0.457	-0.03	0.07
		OBCSS	1.64	0.46	3.59	<.001	0.74	2.54
		OPTSnegxOBCSS	-0.05	0.03	-2.20	.028	-0.10	-0.01

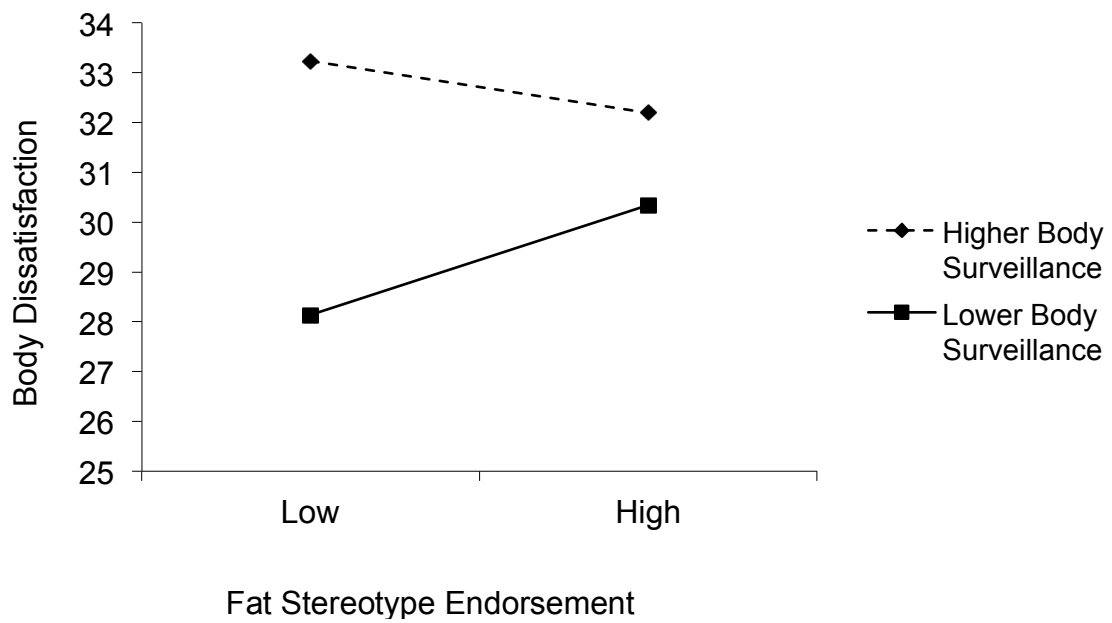
*Note:* RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance Subscale; OPTSneg = Obese Persons Trait Survey negative traits; OPTSnegxOBCSS = interaction between Obese Persons Trait Survey negative traits and Objectified Body Consciousness Scale Surveillance Subscale

Table 4

*Effect of Fat Stereotypes on Body Dissatisfaction at Varying Levels of Body Surveillance for Caucasian Sample (N = 301)*

Body Surveillance	Effect	SE	t	p-value	95% CI	
					Lower Limit	Upper Limit
1.06	.08	.04	1.97	.049	.001	.156
0.00	.02	.03	0.75	.457	-.033	.074
-1.06	-.04	.04	-1.03	.302	-.108	.034

*Note:* Values for body surveillance are the mean and plus/minus one *SD* from the mean.



*Figure 2.* The relationship between fat stereotype endorsement and body dissatisfaction at lower and higher levels of body surveillance ( $N = 301$ ).

**Mediated moderation analysis.** Multiple regression also was used to test the hypothesized mediated moderation. For this analysis, the PROCESS macro for Model 8 was used as it examines mediated moderation through conditional indirect effects (Hayes, 2017). The output also provides an index of moderated mediation, which is equivalent to the indirect effect of an interaction through a mediator in a mediated moderation model (Hayes, 2017). Using the macro, 95% confidence intervals for this indirect effect were generated using 1000 bootstrap samples. A confidence interval that did not include both positive and negative numbers (i.e., did not include 0) indicated a significant effect. To test for the predicted mediated moderation, three regression models were estimated. The first regression was identical to the regression outlined above, testing the interaction between fat stereotypes and body surveillance on body dissatisfaction as the criterion variable. The second regression equation tested the moderation effect on the mediator variable, downward physical appearance comparison. Finally, the third regression equation tested the mediator's partial effect on the criterion variable, body dissatisfaction, while controlling for the interaction between the predictor and moderator variable. The PROCESS macro for Model 8 provided output for both the second and third regressions outlined above. The statistical diagram for the predicted mediated moderation model is depicted in Figure 3.



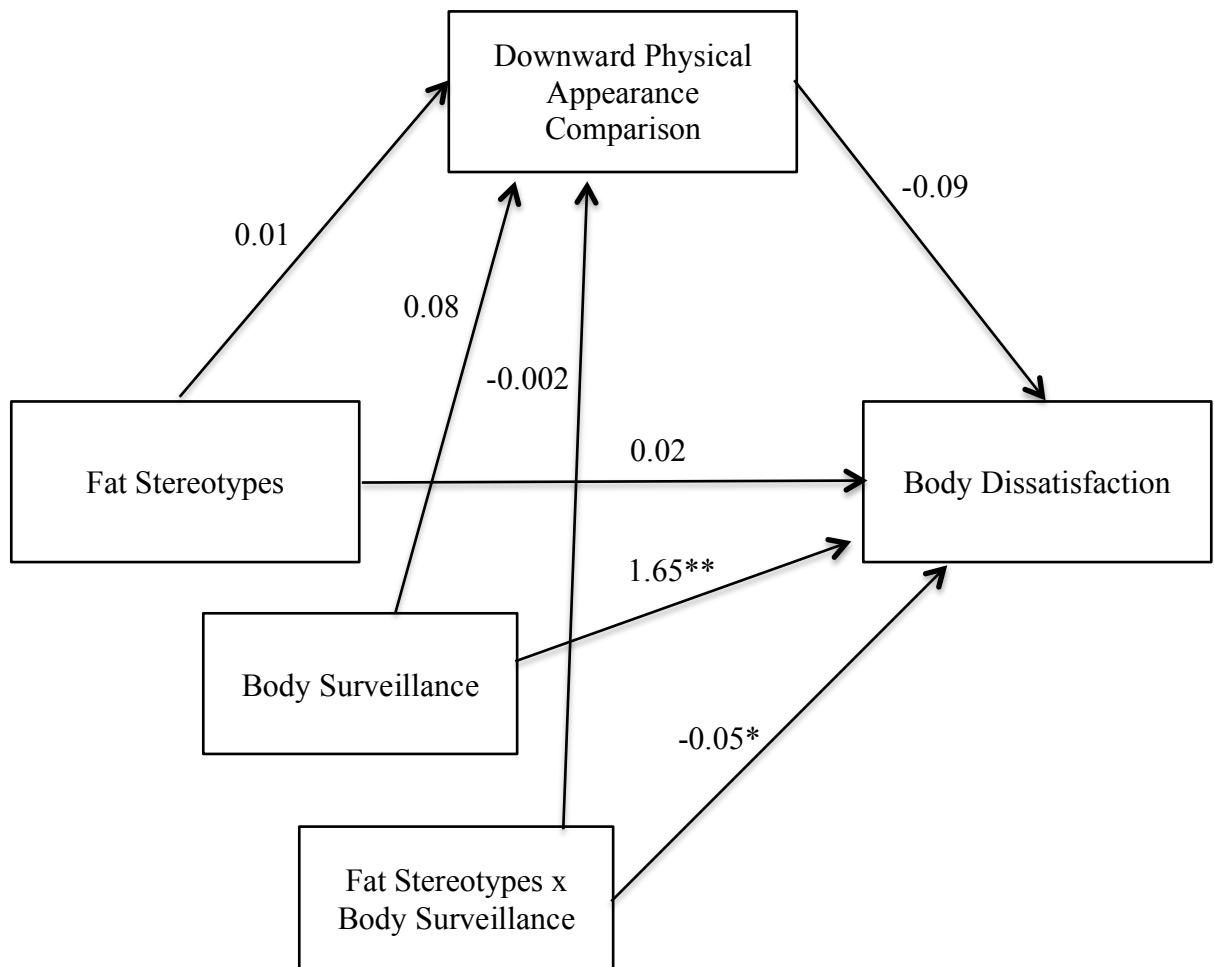


Figure 3. Statistical diagram for predicted mediated moderation model for Study 1.

Regression coefficients are presented. \*  $p < .05$ , \*\* $p < .01$

In the second regression, downward physical appearance comparison was assessed as the criterion variable (see Table 5). The model was significant,  $F(7, 293) = 16.26, p < .001$ , accounting for 27.97% of the variance in downward physical appearance comparison. Depressive symptoms and internalized thin ideals were significant covariates in the model ( $ps < .03$ ). However, neither endorsement of fat stereotypes [ $b = 0.01, t(300) = 1.76, p = .080$ ] nor body surveillance [ $b = 0.08, t(300) = 1.25, p = .213$ ] significantly contributed to the model. Further, the interaction between fat stereotype endorsement and body surveillance did not significantly contribute to the model,  $b = -.003, t(300) = -0.81, p = .416$ , accounting for only an additional .16% of the variance. Because the interaction was not significant, the specific effect of fat stereotypes on downward comparison at varying levels of body surveillance was not examined. This non-significant interaction was unlikely due to insufficient power, given that the effect was quite small. Further, a power analysis indicated that a minimum of 8923 participants would have been required to detect this small effect at a power level of 0.8.

Table 5 also provides a summary of the third regression model examining the partial effect of downward physical appearance comparison on body dissatisfaction, while controlling for the interaction between fat stereotypes and body surveillance. The model was significant,  $F(8, 292) = 40.31, p < .001$ , accounting for 52.48% of the variance in body dissatisfaction. All covariates significantly contributed to the model ( $ps < .003$ ). Fat stereotypes did not significantly contribute to the model,  $b = 0.02, t(300) = 0.76, p = .447$ . However, body surveillance was a significant predictor,  $b = 1.64, t(300) = 3.59, p < .001$ . Further, the interaction between fat stereotype endorsement and body surveillance significantly contributed to the model,  $b = -.05, t(300) = -2.21, p = .028$ .

Finally, downward physical appearance comparison was not a significant predictor,  $b = -.09$ ,  $t(300) = -0.20$ ,  $p = .838$ .

To demonstrate mediated moderation, Muller, Judd, and Yzerbyt (2005) outline several conditions. Hayes (2012) reviews similar steps, though they are not formally required to assess for mediated moderation. Rather, Hayes (2012) recommends examining the significance of the indirect effect of the interaction through the mediator to confirm mediated moderation. Both approaches will be presented below. According to Muller et al. (2005), the first condition is that the regression coefficient for the overall moderation effect in the first regression equation must be significant. This condition was satisfied, indicating that the interaction between fat stereotypes and body surveillance significantly predicted body dissatisfaction. Second, the regression coefficient for the interaction term in the second regression equation must be significant. This condition was not met, indicating that the interaction between fat stereotypes and body surveillance did not significantly predict downward physical appearance comparison, the mediator. Third, the regression coefficient for the mediator term in the third equation must be significant. This condition was not met, indicating that downward physical appearance comparison did not significantly predict body dissatisfaction, while controlling for the interaction. Finally, the regression coefficient for the interaction term in the third regression equation should be reduced in magnitude compared to the overall moderation effect assessed in the first regression equation. This condition was not met, as the interaction term remained unchanged in the third regression. Further, the indirect effect of the interaction through the mediator was not significant {indirect effect = .0002, 95% CI [-.002, .006]}. This confirmed that the difference between the interaction effect on body dissatisfaction without controlling for downward physical

Table 5

*Mediated Moderation Model Summary for Caucasian Sample (N = 301)*

Outcome Variable	<i>R</i>	<i>R</i> <sup>2</sup>	Variables Entered	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>p</i> -value	95% CI	
								Lower Limit	Upper Limit
DPACS	.529	.280	Constant	-0.16	0.88	-0.18	.855	-1.89	1.57
			RSES	0.02	0.01	1.29	.199	-0.01	0.05
			BDI-II	0.02	0.01	2.17	.031	0.001	0.029
			BMI	0.04	0.03	1.28	.201	-0.02	0.10
			SATAQ-IG	0.45	0.07	6.88	<.001	0.32	0.58
			OPTSneg	0.01	0.004	1.76	.080	-0.001	0.01
			OBCSS	0.08	0.06	1.25	.213	-0.05	0.20
			OPTSnegxOBCSS	-0.002	0.003	-0.81	.416	-0.01	0.05
EDI-BD	.724	.525	Constant	1.79	6.41	0.28	.780	-10.82	14.40
			RSES	-0.32	0.10	-3.08	.002	-0.52	-0.12
			BDI-II	0.22	0.05	4.34	<.001	0.12	0.32
			BMI	1.28	0.23	5.59	<.001	0.83	1.73
			SATAQ-IG	2.56	0.51	4.99	<.001	1.55	3.57
			OPTSneg	0.02	0.03	0.76	.447	-0.03	0.08
			OBCSS	1.65	0.45	3.59	<.001	0.74	2.55
			DPACS	-0.09	0.43	-0.20	.838	-0.93	0.75
			OPTSnegxOBCSS	-0.05	0.02	-2.21	.028	-0.10	-0.01

*Note:* RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance Subscale; OPTSneg = Obese Persons Trait Survey negative traits; OPTSnegxOBCSS = interaction between Obese Persons Trait Survey negative traits and Objectified Body Consciousness Scale Surveillance Subscale; EDI-BD = Eating Disorders Inventory 2 Body Dissatisfaction subscale

appearance comparison, and the interaction effect while controlling for downward physical appearance comparison, was not significant (Hayes, 2012). Thus, using both approaches, mediated moderation was not demonstrated and Hypothesis 2 was not supported.

### **Analyses for Full Ethnically Heterogeneous Sample**

**Data preparation.** All data preparation steps presented for the main analyses were repeated for the full ethnically heterogeneous sample. A missing values analysis was conducted on data from valid responders to assess for patterns of missingness. Seventy-nine percent ( $n = 320$ ) of participants provided complete data. The percentage of missing values for all measure items ranged from 0 to 3.5%. Finally, less than 1% of all possible values were missing. Little's MCAR test was not significant,  $\chi^2(4791) = 4775.96, p = .559$ , indicating that the data were missing completely at random. Expectation maximization was used to replace missing values.

**Assumptions of multiple regression.** Assumption analyses for multiple regression were repeated on the full sample. The assumptions of multicollinearity, independence of errors, normal distribution of errors, homoscedasticity and linearity were all satisfied.

Three univariate outliers were identified on BDI and were replaced with the next closest value in the dataset (Tabachnick & Fidell, 2007). One multivariate outlier was identified using Mahalanobis distance and removed from all analyses. No influential cases were identified using Cook's distance and DFFITS values. Finally, no suppressor variables were identified in the final models presented below.

All zero order correlations for the full sample are presented in Table 6. Means and standard deviations for the full sample are presented in Table 7. A paired samples *t*-test

found that participants estimated significantly greater percentages of obese persons possessing negative traits than they did for average-weight persons possessing the same negative traits,  $t(399) = 12.69, p < .001$ . Cohen's  $d$  for this difference was .64, indicating a medium effect.

**Moderation analysis for body dissatisfaction.** Regression analyses using the PROCESS macro for Model 1 were repeated for the full sample. The first regression assessed Hypothesis 1, with body dissatisfaction as the criterion variable. Self-esteem, depressive symptomatology, BMI, and internalized thin ideals were included as significant covariates. Fat stereotype endorsement was included as the independent variable, and body surveillance was entered as the moderator variable. The interaction term between fat stereotype endorsement and body surveillance was then computed using the PROCESS macro. The predictor and moderator variables were centered prior to computing the interaction term (Cohen et al., 2003).

Table 6

*Zero-Order Correlations Between All Variables for Full Sample (N = 400).*

Variables	1	2	3	4	5	6	7	8	9	10
1. MCSDS-C	-									
2. RSES	.27**	-								
3. BDI-II	-.27**	-.67**	-							
4. BMI	<.00	-.08	.07	-						
5. SATAQ-IG	-.28**	-.30**	.27**	.07	-					
6. OPTSneg	-.12*	.02	.03	.04	.13*	-				
7. APTSneg	-.04	-.02	.11*	-.01	.03	.33**	-			
8. OBCSS	-.29**	-.31**	.24**	.11*	.57**	.13*	.04	-		
9. DPACS	-.32**	-.20**	.24**	.10*	.54**	.23**	.10*	.38**	-	
10. EDI-BD	-.21**	-.48**	.47**	.27**	.56**	.08	.02	.49**	.36**	-

*Note:* \*  $p < .05$ , \*\*  $p < .01$ ; MCSDS-C = Marlowe Crowne Social Desirability Scale Form C; RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OPTSneg = Obese Persons Trait Survey negative traits; APTSneg = Average-Weight Persons Trait Survey negative traits; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; DPACS = Downward Physical Appearance Comparison Scale; EDI-BD = Eating Disorders Inventory 2 Body Dissatisfaction subscale

Table 7

*Descriptive Statistics for Full Sample (N = 400)*

Variable	N	Range	M	SD	Cronbach's $\alpha$
MCSDS-C	400	0.00 – 12.00	5.54	2.86	.698 <sup>1</sup>
RSES	400	4.00 – 30.00	19.35	5.32	.888
BDI-II	400	0.00 – 45.00	14.28	10.43	.930
BMI	400	18.5 – 24.90	21.65	1.67	-
SATAQ-IG	400	1.00 – 5.00	3.04	1.02	.936
OPTSneg	400	10.80 – 91.00	57.15	13.13	.843
APTSneg	400	14.00 – 76.34	48.36	10.52	.835
OBCSS	400	1.50 – 7.00	4.71	1.06	.832
DPACS	400	1.00 – 5.00	2.77	1.05	.946
EDI-BD	400	9.00 – 54.00	30.34	9.28	.878

*Note:* <sup>1</sup> denotes a KR-20 value of internal consistency. MCSDS-C = Marlowe Crowne Social Desirability Scale Form C; RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OPTSneg = Obese Persons Trait Survey negative traits; APTSneg = Average-Weight Persons Trait Survey negative traits; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; DPACS = Downward Physical Appearance Comparison Scale; EDI-BD = Eating Disorders Inventory 2 Body Dissatisfaction subscale



Table 8 provides a summary of the final model. The model was significant,  $F(7, 392) = 58.63, p < .001$ , accounting for 51.15% of the variance in body dissatisfaction. All covariates significantly contributed to the model (all  $ps < .003$ ). As expected, endorsement of fat stereotypes did not significantly contribute to the model,  $b = 0.02, t(399) = 0.66, p = .507$ . However, body surveillance was a significant predictor,  $b = 1.34, t(399) = 3.51, p = <.001$ . Finally, adding the interaction term did not significantly improve the prediction of body dissatisfaction,  $F_{\text{change}}(1, 392) = 2.02, p = .156$ , accounting for only an additional 0.25% of the variance. As predicted, the interaction between fat stereotype endorsement and body surveillance did not significantly contribute to the model,  $b = -.03, t(399) = -1.42, p = .156$ , in the ethnically heterogeneous sample. Because the interaction term was not significant, the specific effect of fat stereotypes on body dissatisfaction at varying levels of body surveillance was not examined.

Table 8

*Moderation Model Summary Predicting Body Dissatisfaction for Full Sample (N = 400)*

<i>R</i>	<i>R</i> <sup>2</sup>	Variables Entered	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>p</i> -value	95% CI	
							Lower Limit	Upper Limit
.715	.512	Constant	2.84	5.40	0.52	.600	-7.78	13.46
		RSES	-0.31	0.09	-3.61	<.001	-0.48	-0.14
		BDI-II	0.18	0.04	4.19	<.001	0.09	0.26
		BMI	1.12	0.19	5.68	<.001	0.73	1.51
		SATAQ-IG	3.19	0.40	8.03	<.001	2.41	3.97
		OPTSneg	0.02	0.02	0.66	.507	-0.03	0.06
		OBCSS	1.34	0.38	3.51	<.001	0.59	2.10
		OPTSnegxOBCSS	-0.03	.023	-1.42	.156	-0.08	0.01

*Note:* RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance Subscale; OPTSneg = Obese Persons Trait Survey negative traits; OPTSnegxOBCSS = interaction between Obese Persons Trait Survey negative traits and Objectified Body Consciousness Scale Surveillance Subscale

**Mediated moderation analysis for full sample.** Multiple regression also was used to test for mediated moderation in the full sample. As for the Caucasian-only sample, the PROCESS macro for Model 8 was used for this analysis. The statistical diagram is depicted in Figure 4.

To test for mediated moderation models, three regression models were estimated. The first regression was identical to the moderated multiple regression outlined above, testing the moderation effect on body dissatisfaction as the criterion variable.

The second regression equation tested the moderation effect on the mediator variable, downward physical appearance comparison. In this second regression, downward physical appearance was assessed as the criterion variable (see Table 9). The model was significant,  $F(7, 392) = 26.04, p < .001$ , accounting for 31.74% of the variance in downward physical appearance comparison. Depressive symptoms and internalized thin ideals were significant covariates in the model ( $ps < .05$ ). Further, endorsement of fat stereotypes significantly contributed to the model [ $b = .01, t(399) = 2.26, p = .024$ ], though body surveillance did not [ $b = .09, t(399) = 1.86, p = .064$ ]. Finally, the interaction between fat stereotype endorsement and body surveillance did not significantly contribute to the model,  $b = -.003, t(399) = -0.93, p = .355$ . Because the interaction was not significant, the specific effect of fat stereotypes on downward physical appearance comparison at varying levels of body surveillance was not examined.

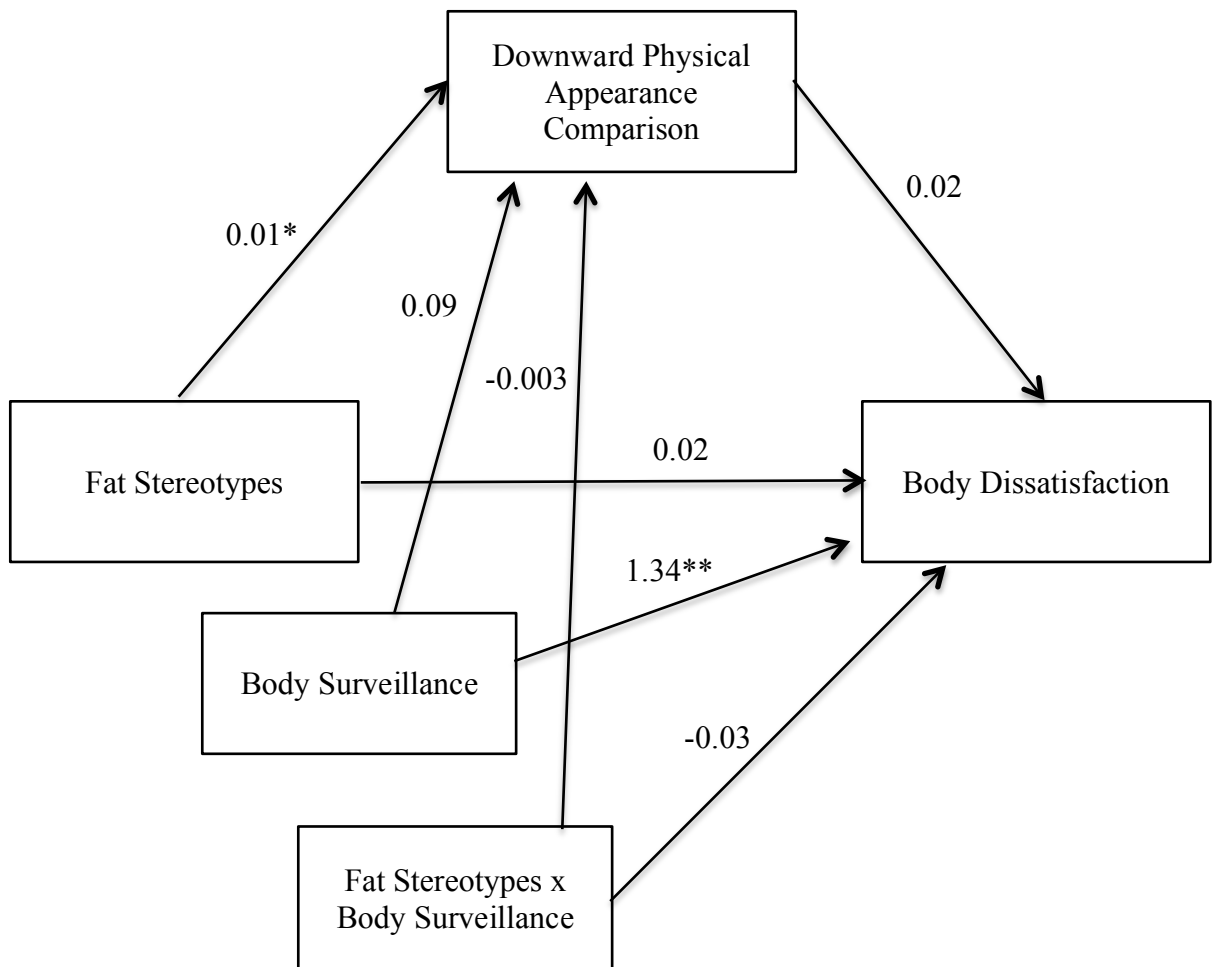


Figure 4. Statistical diagram for predicted mediated moderation model for full sample in Study 1. Regression coefficients are presented. \*  $p < .05$ , \*\*  $p < .01$

Table 9

*Mediated Moderation Model Summary for Full Sample (N = 400)*

Outcome Variable	<i>R</i>	<i>R</i> <sup>2</sup>	Variables Entered	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>p</i> -value	95% CI	
								Lower Limit	Upper Limit
DPACS	.563	.317	Constant	0.14	0.72	0.20	.844	-1.28	1.57
			RSES	0.01	0.01	0.93	.351	-0.01	0.03
			BDI-II	0.01	0.01	2.26	.025	0.001	0.02
			BMI	0.03	0.03	1.27	.206	-0.02	0.09
			SATAQ-IG	0.46	0.05	8.69	<.001	0.36	0.57
			OPTSneg	0.01	0.003	2.26	.024	0.001	0.01
			OBCSS	0.09	0.05	1.86	.064	-0.01	0.20
			OPTSnegxOBCSS	-0.003	0.003	-0.93	.355	-0.01	0.003
EDI-BD	.715	.512	Constant	2.83	5.41	0.52	.601	-7.80	13.47
			RSES	-0.31	0.09	-3.61	<.001	-0.48	-0.14
			BDI-II	0.18	0.04	4.15	<.001	0.09	0.26
			BMI	1.12	0.20	5.66	<.001	0.73	1.51
			SATAQ-IG	3.18	0.43	7.32	<.001	2.32	4.03
			OPTSneg	0.02	0.02	0.65	.514	-0.03	0.06
			OBCSS	1.34	0.39	3.49	<.001	0.59	2.10
			DPACS	0.02	0.38	0.05	.961	-0.72	0.76
			OPTSnegxOBCSS	-0.03	.023	-1.42	.158	-0.08	0.01

*Note:* RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance Subscale; OPTSneg = Obese Persons Trait Survey negative traits; OPTSnegxOBCSS = interaction between Obese Persons Trait Survey negative traits and Objectified Body Consciousness Scale Surveillance Subscale; EDI-BD = Eating Disorders Inventory 2 Body Dissatisfaction subscale

Table 9 also provides a summary of the third regression model examining the partial effect of downward comparison on body dissatisfaction, while controlling for the interaction between fat stereotypes and body surveillance. The model was significant,  $F(8, 391) = 51.17, p < .001$ , accounting for 51.15% of the variance in body dissatisfaction. All covariates significantly contributed to the model ( $ps < .001$ ). As in the first regression, fat stereotypes did not significantly contribute to the model,  $b = 0.016, t(399) = 0.65, p = .514$ . However, body surveillance was a significant predictor,  $b = 1.34, t(399) = 3.49, p = <.001$ . Further, the interaction between fat stereotype endorsement and body surveillance did not significantly contribute to the model,  $b = -0.03, t(399) = -1.42, p = .158$ . Finally, downward physical appearance comparison was not a significant predictor,  $b = 0.02, t(399) = 0.05, p = .961$ .

None of the conditions to demonstrate mediated moderation were met in the full ethnically heterogeneous sample. The interaction between fat stereotypes and body surveillance did not significantly predict body dissatisfaction or downward physical appearance comparison. Further, downward physical appearance comparison did not significantly predict body dissatisfaction, while controlling for the interaction. Finally, the indirect effect of the interaction through the mediator was not significant {indirect effect =  $-.0001, 95\% \text{ CI } [-.004, .003]$ }. Thus, mediated moderation was not demonstrated in the full ethnically heterogeneous sample.

### **Study 1: Discussion**

The first aim of Study 1 was to replicate the moderation effect reported by Kim and Jarry (2014). Similarly to the previous finding, fat stereotype endorsement was not significantly related to body dissatisfaction in this study. However, body surveillance

significantly moderated the relationship between fat stereotype endorsement and body dissatisfaction in normal weight women. As expected, at lower levels of body surveillance, fat stereotyping was positively related to body dissatisfaction. For women with higher body surveillance, however, fat stereotyping did not significantly predict body dissatisfaction, though the trend was in the same direction as that reported by Kim and Jarry (2014). This suggests that though fat stereotype endorsement is not directly related to body dissatisfaction, it is a distal factor that differentially influences body image in women depending on whether they are higher or lower in body surveillance.

For normal weight women who do not regularly monitor their body, endorsing fat stereotypes was found to be harmful to their body satisfaction. Because these women do not monitor their body frequently, they may be less likely to observe the discrepancy between themselves and the obese individuals toward whom they hold negative beliefs. Because of this lower monitoring, the boundaries between themselves and obese individuals may be more vague, thus generating greater body dissatisfaction. For women who monitor their body regularly, their levels of body dissatisfaction were not related to differences in fat stereotype endorsement. Regardless of their perceptions of overweight and obese individuals, these women make highly negative appraisals of their body.

As expected, this moderation effect was found in the Caucasian-only sample and was not observed in the ethnically heterogeneous sample. This replicates the previous finding by Kim and Jarry (2014) and suggests that fat stereotypes uniquely play a role in the body dissatisfaction of Caucasian women. In other ethnic and racial groups, however, fat stereotypes may not influence the appraisal of one's body. Notably, the difference between the mean OPTSneg scores and the mean APTSneg scores was larger in the

Caucasian-only sample compared to the full sample (Cohen's  $d = .25$ ). This suggests that that Caucasian women hold higher levels of fat stereotype endorsement than do non-Caucasian women, and is consistent with past research indicating that Caucasian individuals report greater weight stigma than do individuals of other ethnicities (Hebl et al., 2009; Latner et al., 2005). Evidently, racial and ethnic differences in weight stigma continue to exist. The influence of race and ethnicity on weight-based stigma and body image will be discussed in greater detail in the General Discussion section.

It also is notable that negative beliefs about average weight individuals were not correlated with any of the body image variables in Caucasian normal weight women. In contrast, negative beliefs about obese individuals were moderately correlated to thin ideals, body surveillance, and downward physical appearance comparison. This confirms that negative views about general traits associated with overweight and obese individuals are more connected to body image than are these same views toward average weight women. This further suggests that the association found here between fat stereotypes and body satisfaction, at lower levels of appearance monitoring, is a specific effect rather than the product of a non-specific effect of holding negative beliefs about people in general.

The second purpose of Study 1 was to examine downward physical appearance comparison as a mediator for the observed moderation effect. It was hypothesized that downward physical appearance comparison would be the mechanism through which the interaction between fat stereotype endorsement and body surveillance impacted body dissatisfaction. This hypothesis was not supported in either the Caucasian-only or the full sample as the interaction between body surveillance and fat stereotype endorsement did not significantly predict downward physical appearance comparison. In other words, the



relationship between fat stereotypes and downward physical appearance comparison did not differ at varying levels of body surveillance. Further, downward appearance comparison did not significantly predict body dissatisfaction while controlling for the interaction. This indicates that downward physical appearance comparison was not the explanatory factor for the observed interaction effect between fat stereotypes and body surveillance on body dissatisfaction.

One additional goal of this study was to extend the existing literature on physical appearance comparison. Past studies of physical appearance comparison have not always distinguished between upward and downward directions of comparison. This study aimed to contribute to this literature by examining downward comparison specifically, and its relationship with body surveillance and fat stereotype endorsement. Though there was no interaction effect between fat stereotypes and body surveillance on downward physical appearance comparison, there were significant positive correlations between all of these variables. Specifically, downward physical appearance comparison was correlated to greater fat stereotype endorsement, as well as to greater body surveillance. Interestingly, greater downward physical appearance comparison also was correlated with greater body dissatisfaction in this study. Past research examining this relationship has been somewhat inconsistent, with several studies finding a negative correlation between downward physical appearance comparison and body dissatisfaction (e.g., Bailey & Ricciardelli, 2010; O'Brien et al., 2009) and others finding a positive correlation (e.g., Vartanian & Dey, 2013). Given this variability in findings, it is possible that downward physical appearance comparison and body dissatisfaction have a bidirectional or reciprocal relationship. Conceptual applications of the Social Comparison Theory in the area of

body image imply that body satisfaction is impacted by comparison processes, specifying how engagement in downward versus upward appearance comparison can improve or reduce body satisfaction. In this scenario, body satisfaction is considered to be the criterion variable. Indeed, this was the underlying conceptual premise for the current study. However, it also is likely that engagement in appearance comparison is influenced by one's level of body satisfaction. It is possible that when people are dissatisfied with their body, they are more likely to engage in downward comparison processes. In this case, downward comparison would be the criterion variable. Further, it is possible that other moderating factors influence the direction of the relationship between downward appearance comparison and body dissatisfaction. For example, the extent to which one feels in control of one's weight and shape (i.e., beliefs about weight control; Laliberte et al., 2007) could be a potential moderating variable. If one has strong beliefs that body weight is within their control, engaging in downward comparison could result in improvements in body satisfaction. Alternatively, if one holds beliefs that their body weight is outside of their control, downward comparison could lead to fear of weight gain, leading to body dissatisfaction. Evidently, more research is needed to clarify the potential bidirectional nature of this relationship, and to identify moderators that influence its direction. This may help to further elucidate the discrepancy in findings across studies on the relationship between downward physical appearance comparison and body dissatisfaction.

### Chapter III

#### **Study 2**

Though the proposed model was not supported by correlational findings in the

first study, the aim of the second study was to test causal support for the model through the use of an experimental design. In Study 2, the methodology of presenting information that either challenges or supports fat stereotypes to manipulate endorsement was used. This strategy of information presentation has been implemented successfully in previous studies to reduce weight-based stigma and fat stereotype endorsement (e.g., Crandall, 1994; O'Brien, Puhl, Latner, Mir, & Hunter, 2010; Puhl, Schwartz, & Brownell, 2005; Wiese, Wilson, Jones, & Neises, 1992). For example, Crandall (1994) examined the proposition that an underlying set of beliefs causally precedes the development of anti-fat attitudes. Specifically, Crandall challenged the prevailing stereotypes that overweight and obese individuals lack self-control and willpower. Undergraduate participants were randomly assigned into either an experimental or a control condition. In the experimental condition, participants were presented with information suggesting that overweight is not caused by a lack of self-control, but rather is a result of uncontrollable physiological and genetic factors. Participants read a two-page "persuasive message" that stressed the genetics of weight regulation, reviewing information obtained from both human and animal studies. The essay reported twin studies, the genetic component of weight, and the effects of dieting on metabolism. In the control condition, participants read a two-page message about the effect of psychological stress on illness with no mention of weight. Results showed that compared to participants in the control condition, those in the experimental condition reported lower endorsement of the willpower stereotype, and lower dislike of overweight and obese individuals. This supports the proposition that presenting information that challenges common fat stereotypes is effective at reducing belief in these stereotypes in undergraduate participants.

A more recent study by O'Brien et al. (2010) also examined how information about reasons for obesity can influence beliefs about obese individuals, specifically in undergraduate students enrolled in health promotion and public health programmes. In contrast to Crandall's (1994) study, however, O'Brien and colleagues utilized two experimental conditions. In one condition, participants were provided with an "obesity curriculum" on the controllable reasons for obesity such as diet and exercise. In this condition, participants were presented with information emphasizing research on the prevalence of obesity and its behavioural causes, such as increased calorie consumption and reduced physical activity levels. These classes also provided information on the health consequences of obesity and on behavioural interventions for the treatment of obesity. This condition was intended to increase beliefs in fat stereotypes, promoting the notion that obesity is a result of unfavourable traits. In the second experimental condition, the obesity curriculum focussed on the uncontrollable reasons for obesity such as genetic and environmental factors. This condition was designed to reduce anti-fat prejudice by presenting research on uncontrollable causes of obesity. The prevalence and consequences of obesity were introduced, but the classes emphasized research on the role of biological predispositions and heritability, as well as environmental factors that contribute to obesity such as living in a calorie-dense food environment. Finally, research on high risk drinking in older adolescents and young adults was presented in the control condition.

O'Brien et al. (2010) found that the condition presenting information about uncontrollable causes of obesity resulted in significant reductions of implicit fat stereotypes and explicit endorsement of the willpower stereotype compared to both the

control condition and the condition presenting the controllable causes of obesity. Further, presenting information about uncontrollable causes of obesity resulted in a significant reduction in dislike toward obese individuals based on pre-post difference scores.

However, no differences in explicit anti-fat attitudes between groups were found.

Together, these findings suggest that the method of presenting information about the causes of obesity is likely effective in either heightening or reducing belief in fat stereotypes, though resulting changes in anti-fat attitudes are less consistent. Because one goal of Study 2 was to change endorsement of fat stereotypes and then to examine the resulting effects on body dissatisfaction, this method of presenting information about the causes of obesity was an appropriate manipulation.

An additional goal of Study 2 was to operationalize the theoretical concepts of contrast and assimilation effects in the domain of appearance-based comparison. In studies investigating social comparisons, contrast and assimilation effects have not been directly operationalised. Rather, researchers use experimental manipulations thought to impact the extent to which participants focus on similarities or differences with the comparison target, representing assimilation and contrast effects, respectively (e.g., Broemer & Diehl, 2004; Mussweiler, Ruter, & Epstude, 2004). Self-evaluative judgments on relevant domains are then used as outcome measures to assess the impact of experimentally inducing contrast or assimilation. For example, Mussweiler et al. (2004) presented participants who were athletes with either a description of a standard athlete, thought to induce assimilation effects due to their similarities, or of an extremely high performing athlete, thought to induce contrast effects due to their differences. Participants then were asked to assess their own athletic abilities after reading one of these

descriptions. Thus, assimilation and contrast effects were operationalised through the use of descriptions focussing on either similarities or differences between the participants and the comparison target. In the current study, however, contrast and assimilation effects in the domain of appearance comparison were directly operationalised through the use of the Figure Rating Scale (FRS; Stunkard, Sorenson, & Schulsinger, 1983). Originally, the FRS was developed and validated to index the weight status of research participants' relatives when objective or self-reported values were not available. Since its development, however, the FRS has been used predominantly as a measure of body dissatisfaction by calculating the discrepancy between self-selected current and ideal figures. Respondents are provided with nine figure drawings ranging from very thin to very obese. They then select the drawing that they think is most representative of their current self and the drawing most representative of their ideal self. In this study, the FRS was adapted to assess contrast and assimilation effects. Again, downward physical appearance comparison generally was expected to lead to greater contrast effects. A greater contrast effect would be demonstrated if participants selected a figure that was further away from a standard obese norm marked on the FRS. With the relative absence of downward physical appearance comparison, or if the downward target was indistinct from oneself, it was expected that one would select a figure that was closer to a standard obese norm, thus representing an assimilation effect. This use of the FRS was expected to provide further information that experimentally increasing fat stereotypes leads to a contrast effect in normal weight women with higher body surveillance, while experimentally decreasing fat stereotypes leads to a relative assimilation effect.

**Purposes and Hypotheses**

The first purpose of Study 2 was to examine the causal role of fat stereotypes on body dissatisfaction by experimentally manipulating the extent of their endorsement through the presentation of information that either supports or challenges common fat stereotypes. The mediated moderation model depicted in Figure 1 presents fat stereotype endorsement as a distal causal factor that can differentially impact body dissatisfaction in women depending on their level of body surveillance. Accordingly, reported body dissatisfaction was expected to differ depending on the interaction between experimental condition (support versus challenge fat stereotypes) and body surveillance (lower versus higher). The second purpose of Study 2 was to assess whether state downward physical appearance comparison mediated this moderated effect, as described above. The specific hypotheses for Study 2 are outlined below:

1. Body surveillance will moderate the impact of study condition on state body dissatisfaction. Specifically, normal weight women with higher body surveillance will report lower state body dissatisfaction after reading information that supports common fat stereotypes compared to information that challenges common fat stereotypes. In contrast, normal weight women with lower body surveillance will report higher state body dissatisfaction after reading information that supports common fat stereotypes compared to information that challenges fat stereotypes.
2. This moderated effect will be mediated by level of state downward physical appearance comparison. Specifically, the interaction between fat stereotypes and body surveillance will predict state downward physical appearance comparison. At higher levels of body surveillance, experimentally increasing

fat stereotypes will lead to higher levels of state downward physical appearance comparison compared to experimentally decreasing fat stereotypes. At lower levels of body surveillance, experimentally increasing fat stereotypes also will lead to greater downward comparison compared to experimentally decreasing fat stereotypes, though to a lesser extent than in women with high body surveillance. Finally, greater state downward physical appearance comparison is expected to predict lower state body dissatisfaction while controlling for the interaction, thus completing the mediated moderation model.

3. Level of body surveillance also will moderate the impact of study condition on the degree of contrast between a self-selected current body size and an “obese norm” on the Figure Rating Scale. Specifically, normal weight women with higher body surveillance will report a larger degree of contrast between the self-selected current figure and the obese norm after reading information supporting fat stereotypes compared to information challenging fat stereotypes. Conversely, normal weight women with lower body surveillance will report a smaller degree of contrast between the self-selected current figure and the obese norm after reading information supporting fat stereotypes compared to information challenging fat stereotypes.
4. State downward physical appearance comparison will be positively correlated with the discrepancy between current body size and an “obese norm.”

## **Study 2: Method**

### **Design**



In this study, an experimental design was employed examining a categorical manipulated independent variable (i.e., study condition) and a continuous moderator subject variable (i.e., body surveillance). Two experimental conditions were utilized. In the support condition, participants read a mock health report that supported fat stereotypes by presenting information highlighting the controllable elements of weight such as food choices and engagement in exercise (see Appendix M). In the challenge condition, participants read a mock health report that challenged fat stereotypes by presenting information emphasizing the uncontrollable elements of weight such as genetic factors and environmentally restricted food choices (see Appendix N). Based on past studies, these conditions were expected to increase and decrease endorsement of fat stereotypes, respectively (Crandall, 1994; O'Brien et al., 2010). The moderator variable, body surveillance, was measured through self-report. To test the proposed mediated moderation model, the dependent variable was state body dissatisfaction, and the mediator was state downward physical appearance comparison, both measured through self-report. Analyses examined the impact of study condition on state body dissatisfaction at higher and lower levels of body surveillance. Analyses then examined the potential mediating effect of state downward comparison. Finally, additional analyses examined the impact of study condition on figure rating discrepancies at higher and lower levels of body surveillance.

### **Participants**

Participants were recruited from the Psychology Participant Pool at the University of Windsor and received 1.5% course credit for their participation. Because one of the experimental conditions increased fat stereotype endorsement, people with overweight or

obesity were excluded from the full study to avoid greater internalization of these stereotypes and to prevent highly distressing feelings in these individuals. Further, because one of the experimental conditions described in detail the role of physical activity and diet in weight, people with current or previous eating disorder diagnoses were excluded from this study. To facilitate recruitment with these exclusionary criteria in mind, the study was completed in two parts (described in the Procedure section below). The first part of the study was open to all women registered in the pool. From this sample, only those participants who met full study criteria were recruited to complete the second part of the study. Thus, only women with a BMI between 18.5 to 25 kg/m<sup>2</sup> took part in the second part of the study and were retained in the final analyses.

In the first part of the study, data were collected from a total of 701 participants. Of these participants, 459 were normal weight. Within this group, 7 participants reported current or previous eating disorder diagnoses. Thus, 452 normal weight participants were invited to participate in the second part of the study, 280 of whom responded. A total of 273 participants completed the second part of the study. To examine any potential biases in recruitment, a series of independent samples *t*-tests were conducted comparing participants who did and did not enrol in the second part of the study. Based on data collected in the first part, no significant differences were found on measures of body surveillance, internalized thin ideals, depressive symptoms, self-esteem, BMI, or social desirability (all *ps* > .281).

The mean age of participants was 20.67 years (*SD* = 4.45) and their mean self-reported BMI was 21.83 kg/m<sup>2</sup> (*SD* = 1.78). Self-reported race and ethnicity were as follows: 70.6% Caucasian, 10.4% South Asian, 7.8% Arab or West Asian, 3.3% African

Canadian, 1.9% East Asian, 0.4% South American, 0.4% Native Canadian, 3.7% reported two or more ethnic backgrounds, and 2.4% reported other ethnic background.

In terms of years of university education, 31.6% were in their first year, 23.8% were in their second year, 21.9% were in their third year, 15.6% were in their fourth year, and 6.3% had attended university for more than four years. Additionally, 40.9% of participants were psychology majors. In terms of current employment status, 63.2% were employed and 36.1% were unemployed.

### **Materials**

As described above, mock health reports were used for the experimental manipulation. These health reports were based on materials described by Crandall (1994), O'Brien et al. (2010) and Wiese et al. (1992). In the support condition, the mock health report reviewed research suggesting that obesity is a function of behavioural and environmental factors that are personally controllable, such as dieting and exercise (Appendix M). This information supports the notion that weight and fat are the result of personal deficiencies, and thus was expected to result in relatively higher fat stereotype endorsement than the challenge condition (O'Brien et al., 2010).

In the challenge condition, the mock health report reviewed research suggesting that obesity is the function of genetics, biology, and uncontrollable environmental factors (Appendix N). This information was contrary to common fat stereotypes. Previous studies have indicated that information suggesting that excess weight is not simply the result of personal deficiencies, such as laziness or lack of willpower, reduces fat stereotypes and weight-based stigma (Crandall, 1994; O'Brien et al., 2010; Wiese et al., 1992).

## Measures

**Moderator variable.** As described in Study 1, the OBCSS was used to measure level of body surveillance. In the current study, the OBCSS had good internal consistency,  $\alpha = .86$ .

**Mediator variable.** As described in Study 1, the DPACS was used to measure the tendency to engage in downward physical appearance comparison. For Study 2, a state version of this measure was used (Appendix O) following Thompson's (2004) recommendations of modifying trait-based scales to fit experimental designs. Specifically, the instructions and wording of the items were modified slightly to gather state, rather than trait, information. For example, the item "At parties I often compare my looks to the looks of unattractive people" was modified to "If I was at a party right now, I would compare my looks to the looks of unattractive people." Further, participants were asked to respond to these items in accordance to how they feel "at this very moment" (Thompson, 2004). In the current study, this state version of the DPACS had strong internal consistency,  $\alpha = .92$ .

**Criterion variables.** The Body Image States Scale (BISS; Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002; Appendix P) is a 6-item self-report measure of state body dissatisfaction. Participants respond on a 9-point scale in accordance with how they feel "right now, at this very moment." For example, Item 1 of the scale ranges from "Extremely dissatisfied with my appearance" to "Extremely satisfied with my appearance." In its original form, higher scores indicate greater state body satisfaction. To maintain conceptual consistency within this research, however, participants' responses to each item were reverse coded such that higher scores indicated greater state

body *dissatisfaction*. The BISS has demonstrated good internal consistency, with alphas ranging from .77 to .90 (Cash et al., 2002). The BISS also has demonstrated good convergent validity with the Body Areas Satisfaction subscale of the Multidimensional Body-Self Relations Questionnaire ( $r = .77$ ; Cash et al., 2002). In the current study, the BISS had good internal consistency,  $\alpha = .86$ .

The Figure Rating Scale (FRS; Stunkard, Sorenson, & Schulsinger, 1983; Appendix Q) depicts nine schematic drawings of female bodies arranged from very thin to very obese. In this study, the FRS was adapted to assess for contrast and assimilation. To retain conceptual clarity, an approach used by Mills, Jadd, and Key (2012) was followed. In their study, undergraduate women were provided with information about body norms by marking a “population average” on the FRS. Participants then were asked to mark on separate rows the drawing that best represented their current body size, followed by their ideal body size. In the current study, the figure representing an “obese norm” was highlighted on the scale. Participants then were asked, “Compared to this average obese person, select the figure that best represents your current body size.” On a separate row, participants were asked, “Compared to this average obese person, select the figure that best represents your ideal body size.” Though current versus ideal were specified for conceptual clarity, only the current figures were used in the analyses. A greater discrepancy between the selected current self and the obese norm represented a greater contrast effect. A smaller discrepancy represented a relative assimilation effect.

**Covariates.** As described in Study 1, the SATAQ-IG, RSES, BDI-II, and MCSDS-C were used to assess internalization of thin ideals, trait self-esteem, depressive symptomatology, and socially desirable responding as potential covariates. In the current

study, these measures had adequate to excellent internal consistency, with alphas of .93, .92, .93, and .72, respectively. To check whether participants were simply clicking through the questions without reading them, an additional item was added to the end of the RSES asking participants to select the response “disagree”, and to the end of the BDI asking participants to select the response “0.” Both the BDI-II and MCSDS-C was excluded from final analyses because they did not significantly contribute to the regression models.

Finally, the demographic questionnaire was administered to obtain basic demographic information, as well as self-reported weight and height.

**Manipulation check.** The OPTSneg, described in Study 1, was used as a manipulation check measure. It was expected that participants in the stereotype support condition would report higher OPTSneg scores than would participants in the challenge condition. To ensure specificity of the manipulation, the APTSneg also was administered. No differences across conditions were expected on the APTSneg. In the current study, both the OPTSneg and APTSneg had good internal consistency,  $\alpha = .88$  and  $\alpha = .88$  respectively.

## **Procedure**

This study involved two components. In order to minimize demand characteristics, the true purpose of the study was not disclosed initially, and the two components were presented as separate studies on the Psychology Participant Pool. In the first component, participants were informed that the online study was being conducted to examine the relationship between individual difference variables and mental health (see Appendix R for advertisement). The second component was advertised as an online study

examining memory for health information (see Appendix R for advertisement). Normal weight participants who completed the first component were invited via email to take part in the second component, an ostensibly unrelated study. Participants were told that they were being contacted via email to facilitate recruitment for an unrelated study. The second component was accessible on the participant pool only to those participants who received the email invitation. Participants received 0.5% bonus points for participating in the first component, and 1.0% bonus point for participating in second component.

In this study's original proposal, it was planned that participants would complete the first component online and the second component in the laboratory. However, recruitment for this was challenging. After having the study available on the participant pool for two semesters, only 18% ( $n = 16$ ) of eligible normal weight participants who completed the first component also completed the second component. Because at least 200 participants were required, this method of recruitment did not seem feasible. Thus, ethics approval was obtained to move the second component of this study online. Because participants were being recruited from the same source (i.e., eligible students registered in the participant pool and who completed the first component of the study), and because participants completed the study on the computer using electronic versions of all materials in the original laboratory procedure, no significant impact on the data was expected.

After signing up for the first component, participants were emailed a link to the study webpage. After providing informed consent (see Appendix S), participants completed the demographic questionnaire and measures of depressive symptomatology, body surveillance, socially desirable responding, internalized thin ideals, and self-esteem.

The order of presentation of measures was as follows: demographic questionnaire, BDI-II, OBCSS, MCSDS-C, SATAQ-IG, and RSES. This order of presentation alternated body image variables with non-appearance related variables. After completion of the measures, all participants were given a stand-in debriefing form, describing the relationships between body image, mood, and self-esteem (Appendix T). Then, participants who were of normal weight were emailed an invitation to take part in the second component, presented as an unrelated study. Those who agreed to enroll in the second component were manually registered to the study on the participant pool and were randomly assigned to a study condition. Participants then were provided with an email link to the study. After providing informed consent (see Appendix U), participants were asked to read carefully a health report about the causes of weight and various traits associated with it. They also were told that they would be given a memory test about the content of the report to ensure that they were attending to the information. After reading the mock health report in their respective conditions, participants completed the brief memory test (Appendix V) to confirm that they read through the information and to maintain the pretense of the study. Participants then were asked to complete a series of questionnaires. Based on similar instructions provided by Trottier, Polivy, and Herman (2007), participants were told that these questionnaires were being administered because their thoughts about themselves may have impacted their memory of the information that they read. Participants completed the BISS, followed by the state DPACS, FRS, OPTSneg, and APTSneg.

Finally, participants were directed to a separate debriefing webpage (Appendix W) where they responded to several questions and watched a series of videos. First,



participants were asked to type what they believed the study investigated. Participants then were asked what they believed to be the true hypotheses of the study. After this, participants watched a video of the primary researcher explaining why it is sometimes necessary not to provide the true purposes of a study at the outset, and then disclosed the true aims and hypotheses of this study. Participants then watched a video explaining the stigmatization of overweight and obese individuals, and the negative consequences resulting from weight-based prejudice and discrimination. The video also provided a summary of the information contained within the health report of the condition to which they were *not* assigned. This was particularly important for participants in the support condition to ensure that they had a well-informed and complete understanding of the causes of weight, and that they did not leave the study with an enhanced bias against larger people. This video further emphasized that overweight and obesity are not representative of individual character flaws that are commonly described in fat stereotypes. It also highlighted the harmful effects of holding such stereotypes on people who are overweight or obese, and the complex nature of the determinants of weight. Notably, past studies have used a similar debriefing strategy of presenting balanced information (e.g., Crandall, 1994; Puhl et al., 2005), though specific details about the effects of this debriefing have not been reported. It was anticipated that presenting balanced information about the causes of weight would be an effective strategy, given that past studies have indicated that providing education about both the genetic and behavioural determinants of weight reduces stigmatizing attitudes toward overweight individuals (e.g. Diedrichs & Barlow, 2011; Hilbert, 2016). Further, past studies have used a pre-post design to examine changes in weight stigma after providing information

about the various causes of weight. These studies indicated that providing education about the biogenetic causes of obesity to participants with existing higher levels of weight stigma at baseline was effective at decreasing explicit stigmatizing attitudes post-intervention (e.g., Diedrichs & Barlow, 2011; Puhl et al., 2005; O'Brien et al., 2011), and over several weeks of follow-up (e.g., Diedrichs & Barlow, 2011; Hilbert, 2016).

Participants then answered two questions about the true purposes of the study to ensure that they understood the information provided in the debriefing process. Participants then watched a final video asking them not to reveal the true purposes of the study to any other potential participants. Next, they were provided with the opportunity to share any comments, questions, or concerns about the study, to which the researcher would respond in a timely manner. Other than one minor technical issue, no participants expressed concerns or questions about the study after being fully debriefed. Five participants stated either that they found the study to be informative or that they learned more about weight-based stigma after the debriefing process, and 10 participants stated that they enjoyed the study. Finally, participants provided consent for data retention, thus completing the debriefing process.

## **Study 2: Results**

### **Approach to Data Analysis**

All analyses were performed using SPSS for Mac (Version 25.0). Missing values and reliability analyses were conducted. Assumptions of multiple regression were assessed, followed by descriptive analyses. Finally, all of the hypotheses were tested using a series of multiple regression analyses using the Hayes (2017) PROCESS macro for SPSS. These steps were conducted first for the Caucasian-only sample, and then

repeated for the full ethnically heterogeneous sample. As in Study 1, separate analyses could not be conducted on women of non-Caucasian ethnicities because of limited sample sizes.

### **Main Analyses for Caucasian-Only Sample**

**Data preparation.** The validity indicators were checked to ensure that only data for participants who were attentive to the questionnaires and to the mock health reports were included in the analyses. Participants who failed both of the validity indicators in the first component (i.e., did not select the option they were asked to select on an item added to the BDI-II and RSES;  $n = 2$ ), and those who failed the validity indicator in the second component (i.e., answered more than 2 questions wrong on the memory quiz;  $n = 1$ ) were not included in the analysis. After removing the three participants who failed the validity indicators, the total Caucasian sample size was  $N = 190$ .

A missing values analysis was conducted on data from valid responders to assess for patterns of missingness. Eighty-four percent ( $n = 160$ ) of participants provided complete data. The percentage of missing values for all measure items ranged from 0 to 1.1%. Finally, less than 1% of all possible values were missing. Little's MCAR test was not significant,  $\chi^2(2868) = 2834.32, p = .669$ , indicating that the data were missing completely at random. Expectation maximization was used to replace missing values given the small amount of missing data (Tabachnick & Fidell, 2007).

**Assumptions of multiple regression.** The assumptions for multiple regression were examined according to the procedures outlined by Field (2009) and Tabachnick and Fidell (2007). The assumption of the absence of multicollinearity was assessed by examining correlations between variables, and checking variance inflation factors (VIF).

This assumption was satisfied as none of the variables had correlations above  $|.77|$  (see Table 10 for all zero-order correlations), and none of the VIF values approached the cut-off of 10 (Cohen et al., 2003). To assess the assumption of independence of errors, the Durbin-Watson statistic was examined and was close to the acceptable value of 2 (Field, 2009). Further, data were collected cross-sectionally, and there was no relationship between participants (Field, 2009). Accordingly, independence of errors was assumed.

Next, the assumptions of normally distributed errors, homoscedasticity, and linearity were assessed. For each regression, the scatterplot of standardized residual versus standardized predicted outcome appeared as a cloud, and did not appear to have a wave or funnel pattern. Thus, linearity and homoscedasticity were assumed. Additionally, the histograms of standardized residuals approximated the normal curve, and the Shapiro-Wilk's statistic for the standardized residuals was not significant,  $SW(190) = .990, p = .184$ . Thus, normal distribution of errors was assumed.

Tabachnick and Fidell (2007) recommend assessing univariate normality for each predictor. Based on the  $SW$  statistic, six predictors were not normally distributed. Thus, a transformation was applied to each predictor. However, these transformations did not reduce the  $SW$  statistics to non-significance, nor did they significantly change the results of the final regression model. Because the assumptions of homoscedasticity, linearity, and normally distributed errors had been satisfied, and because normality of predictors is not assumed for multiple regression, the non-transformed predictor variables were used in the main analyses (Tabachnick & Fidell, 2007).

Finally, the data were examined for univariate outliers, residual outliers, multivariate outliers, and influential cases, by study condition. One univariate outlier was

identified on body surveillance and was replaced with the next closest value in the dataset (Tabachnick & Fidell, 2007). Residual outliers were examined using standardized residual values, and multivariate outliers were examined using both Mahalanobis distance and leverage values. No residual or multivariate outliers were identified. No influential cases were identified using both Cook's distance and DFFITS values.

Structure coefficients were examined for all variables included in the final regressions (Courville & Thompson, 2001). The directional signs for all significant regression coefficients were the same as those for the corresponding structure coefficients. Additionally, all predictor variables that significantly contributed to the final model also were significantly correlated with the predicted outcome. Thus, no suppressor variables were identified in the final models presented below.

Table 10

*Zero-Order Correlations Between All Variables for Caucasian Sample (N = 190).*

Variables	1	2	3	4	5	6	7	8	9	10	11
1. MCSDS-C	-										
2. RSES	.39**	-									
3. BDI-II	-.39**	-.77**	-								
4. BMI	-.11	-.08	.04	-							
5. SATAQ-IG	-.26**	-.29**	.23**	.26**	-						
6. OBCSS	-.29*	-.39**	.37**	0.17*	.65**	-					
7. FRS	.22**	.24**	-.20**	-.52**	-.27**	-.24**	-				
8. OPTSneg	-.14*	-.02	.07	.08	.18*	.23**	.06	-			
9. APTSneg	-.10	-.06	.06	.14	.09	.06	-.05	.43*	-		
10. SPACS	-.30**	-.30**	.27**	.28**	.45**	.39**	-.30**	.15*	.09	-	
11. BISS	-.29**	-.48**	.43**	.36**	.47**	.47**	-.55**	.07	.08	.42**	-

*Note:* \*  $p < .05$ , \*\*  $p < .01$ ; MCSDS-C = Marlowe Crowne Social Desirability Scale Form C; RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; FRS = Figure Rating Scale; OPTSneg = Obese Persons Trait Survey negative traits; APTSneg = Average-Weight Persons Trait Survey negative traits; SPACS = State Downward Physical Appearance Comparison Scale; BISS = Body Image States Scale

Means and standard deviations for all variables, grouped by condition, are presented in Table 11. A series of independent sample *t*-tests found no significant differences across the two conditions on the predictor variables, with the exception of BMI. Thus, randomization to experimental condition was mostly successful, and only body mass index was controlled for in the final regression models. Further, internalized thin ideals was controlled for in the regression models given its documented relationship with fat stereotypes, body surveillance, and body dissatisfaction, and to retain conceptual consistency with Study 1. Finally, the OPTSneg and APTSneg were examined to assess the success of the manipulation. Independent sample *t*-tests were conducted on both the OPTSneg and APTSneg across the two conditions. As expected, participants in the support condition reported significantly higher percentages on the OPTSneg than did participants in the challenge condition. Further, the interaction between study condition and body surveillance on fat stereotypes was examined to ensure that the manipulation was effective in both women of higher and lower body surveillance. Indeed, the interaction was not significant. At both higher and lower body surveillance, greater fat stereotypes were endorsed in the support condition than in the challenge condition. Finally, there was no significant difference on the APTSneg between conditions, indicating that the manipulation was specific to beliefs about obese persons only. This was consistent across higher and lower levels of body surveillance. Thus, the manipulation was successful.

**Moderation analysis for state body dissatisfaction.** The first multiple regression examined the moderation effect on state body dissatisfaction. As in Study 1, the PROCESS macro for Model 1 was used for this analysis. In this regression, BMI and internalized thin ideals were included as significant covariates. Study condition was the

Table 11

*Descriptive Statistics by Condition for Caucasian Sample*

Variable	Support condition ( $n = 92$ )			Challenge condition ( $n = 98$ )		
	$M$	$SD$	Range	$M$	$SD$	Range
MCSDS-C	6.55	2.95	0.00 – 13.00	6.46	2.99	1.00 – 12.00
RSES	19.53	6.26	6.00 – 30.00	19.03	6.11	5.00 – 30.00
BDI-II	14.01	10.94	0.00 – 47.00	13.83	10.86	0.00 – 49.00
BMI*	22.34	1.79	18.60 – 24.98	21.67	1.79	18.50 – 24.99
SATAQ-IG	3.31	0.92	1.00 – 5.00	3.11	0.99	1.00 – 5.00
OBCSS	4.83	1.09	1.78 – 7.00	4.78	1.09	1.88 – 6.63
FRS	4.18	1.00	2.00-6.00	4.25	1.04	2.00 – 6.00
OPTSneg**	60.53	12.86	22.00 – 84.60	54.33	15.58	12.30 – 100.00
APTSneg	48.84	10.86	15.50 – 76.50	47.87	13.92	22.50 – 100.00
SPACS	2.52	1.04	1.00 – 5.00	2.50	0.88	1.00 – 5.00
BISS	3.74	1.60	0.67 – 7.33	3.74	1.45	0.83 – 7.17

*Note:* mean differences between groups denoted by \*  $p < .05$ , \*\*  $p < .01$ . MCSDS-C = Marlowe Crowne Social Desirability Scale Form C; RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; FRS = Figure Rating Scale; OPTSneg = Obese Persons Trait Survey negative traits; APTSneg = Average-Weight Persons Trait Survey negative traits; SPACS = State Downward Physical Appearance Comparison Scale; BISS = Body Image States Scale



independent variable and body surveillance was the moderator variable. The interaction term between study condition and body surveillance was then computed using the PROCESS macro. To aid interpretation, the moderator variable was centered prior to calculating the interaction term (Cohen et al., 2003).

Table 12 provides a summary of the final model. The model was significant,  $F(5, 184) = 19.67, p < .001$ , accounting for 34.83% of the variance in state body dissatisfaction. Both covariates significantly contributed to the model ( $ps < .004$ ). Study condition was not significant,  $b = -0.25, t(189) = -1.34, p = .181$ . However, body surveillance was a significant predictor,  $b = .38, t(189) = 3.46, p = .001$ . Finally, adding the interaction term significantly improved the prediction of body dissatisfaction,  $F_{\text{change}}(1, 184) = 3.93, p = .049$ , accounting for an additional 1.14% of the variance. As predicted, the interaction between study condition and body surveillance significantly contributed to the model,  $b = 0.34, t(189) = -1.97, p = .049$ .

The specific effect of study condition on state body dissatisfaction at varying levels of body surveillance was examined (see Table 13 and Figure 5). Contrary to Hypothesis 1, women with lower body surveillance (1 *SD* below the mean) reported lower state body dissatisfaction in the support condition compared to those in the challenge condition,  $t(189) = -2.21, p = .028, 95\% \text{ CI } [-1.08, -0.06]$ . In contrast, women with higher levels of body surveillance (1 *SD* above the mean) did not differ in their reports of state body dissatisfaction across study conditions,  $t(189) = 0.30, p = .763, 95\% \text{ CI } [-0.43, 0.59]$ . Accordingly, Hypothesis 1 was partially supported. As in Study 1, body surveillance levels at 1 *SD* above and below the mean in this sample were comparable to the levels reported by Kim and Jarry (2014).

Table 12

*Moderation Model Summary Predicting State Body Dissatisfaction for Caucasian Sample**(N = 190)*

<i>R</i>	<i>R</i> <sup>2</sup>	Variables Entered	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>p</i> -value	95% CI	
							Lower Limit	Upper Limit
.590	.348	Constant	-1.12	1.14	-0.98	.331	-3.37	1.14
		BMI	0.23	0.05	4.32	<.001	0.12	0.33
		SATAQ-IG	0.38	0.13	2.98	.003	0.13	0.63
		Condition	-0.25	0.18	-1.34	.181	-0.61	0.12
		OBCSS	0.38	0.11	3.46	<.001	0.16	0.60
		ConditionxOBCSS	0.34	0.17	1.98	.049	0.06	0.63

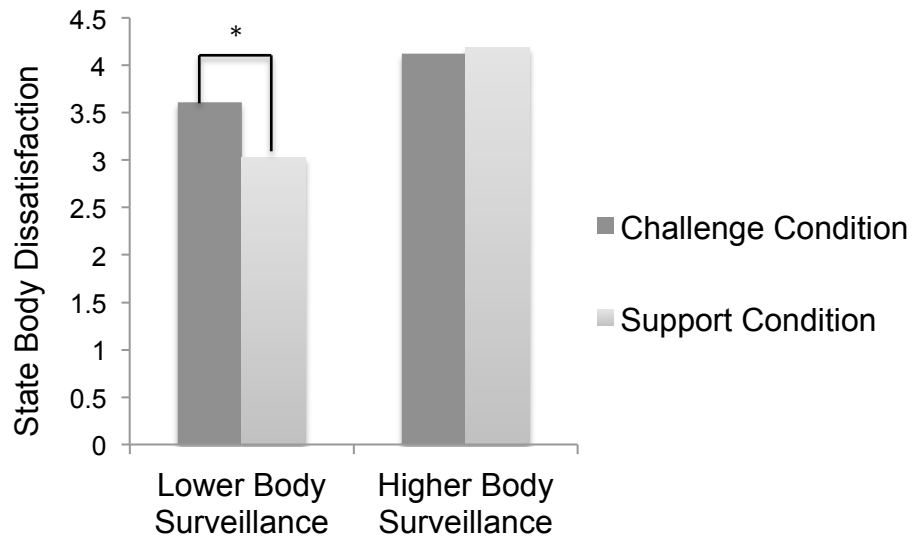
*Note:* BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; ConditionxOBCSS = interaction between Condition and Objectified Body Consciousness Scale Surveillance Subscale

Table 13

*Effects of Study Condition on State Body Dissatisfaction at Varying Levels of Body Surveillance for Caucasian Sample (N = 190)*

Body Surveillance	<i>Effect</i>	<i>SE</i>	<i>t</i>	<i>p</i> -value	95% CI	
					Lower Limit	Upper Limit
-1.08	-.57	.26	-2.21	.028	-1.08	-0.06
0.00	-.25	.18	-1.34	.181	-0.61	0.11
1.08	.08	.26	0.30	.763	-0.43	0.59

*Note:* Values for body surveillance are the mean and plus/minus one *SD* from the mean.



*Figure 5.* The impact of condition on state body dissatisfaction at lower and higher levels of body surveillance ( $N = 190$ ). \*  $p < .05$

**Mediated moderation analysis.** Multiple regression also was used to test the hypothesized mediated moderation. As in Study 1, the PROCESS macro for Model 8 was used as it examines mediated moderation through conditional indirect effects. The output also provides an index of moderated mediation, which is equivalent to the indirect effect of an interaction through a mediator in a mediated moderation model (Hayes, 2017). Using the macro, 95% confidence intervals for this indirect effect were generated using 1000 bootstrap samples. To test for mediated moderation models, three regression models were estimated. The first regression was identical to the moderated regression outlined above, testing the moderation effect on state body dissatisfaction as the criterion variable. The second regression equation tested the moderation effect on the mediator variable, state downward physical appearance comparison. Finally, the third regression equation tests the mediator's partial effect on the criterion variable, state body dissatisfaction, while controlling for the interaction between the predictor and moderator variables. The PROCESS macro for Model 8 provides output for both the second and third regressions outlined above. The statistical diagram for the predicted mediated moderation model is depicted in Figure 6.

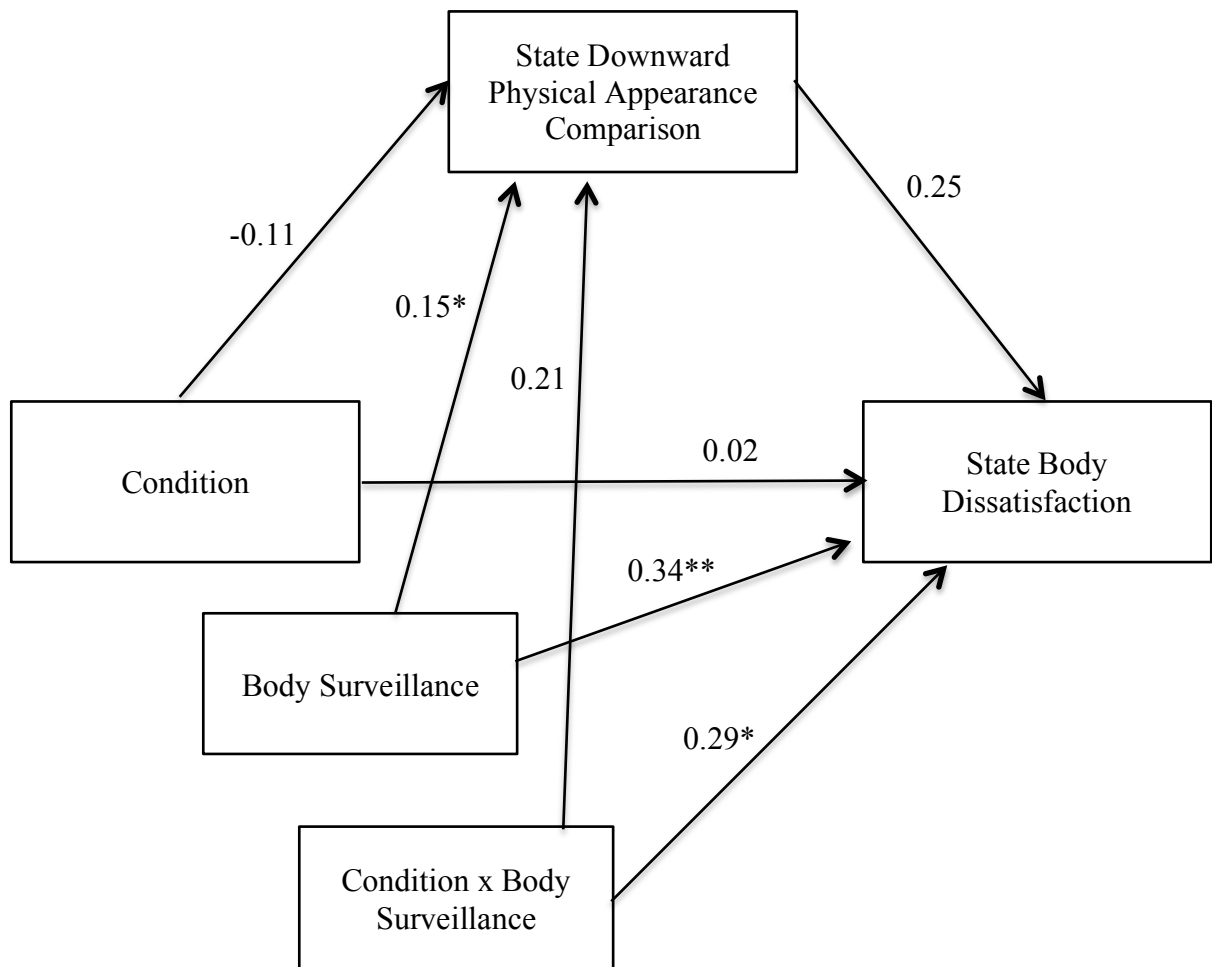


Figure 6. Statistical diagram for predicted mediated moderation model for Study 2.

Regression coefficients are presented. \*  $p < .05$ , \*\* $p < .01$

In the second regression, state downward physical appearance was assessed as the criterion variable. Table 14 provides a summary of the final model for this second regression. The model was significant,  $F(5, 184) = 13.24, p < .001$ , accounting for 26.46% of the variance in state downward physical appearance comparison. Both covariates significantly contributed to the model ( $ps < .008$ ). Study condition was not significant,  $b = -0.11, t(189) = -0.92, p = .356$ . However, body surveillance was a significant predictor,  $b = .15, t(189) = 2.06, p = .040$ . Finally, the interaction between study condition and body surveillance was not significant,  $b = 0.21, t(189) = 1.85, p = .065$ , accounting for an additional 1.37% of the variance. Because the interaction was not significant, the specific effect of study condition on downward comparison at varying levels of body surveillance was not examined. A power analysis indicated that a minimum of 923 participants would have been required to detect this small effect at a power level of 0.8.

Table 14 also provides a summary of the third regression equation examining the partial effect of state downward physical appearance comparison on state body dissatisfaction, while controlling for the interaction between study condition and body surveillance. The model was significant,  $F(6, 183) = 17.76, p < .001$ , accounting for 36.80% of the variance in state body dissatisfaction. Both covariates significantly contributed to the model ( $ps < .03$ ). Study condition was not significant,  $b = -0.22, t(189) = -1.19, p = .234$ . However, body surveillance was a significant predictor,  $b = .34, t(189) = 3.11, p = .002$ . While the interaction significantly contributed to the model [ $b = 0.29, t(189) = 2.00, p = .048$ ], state downward physical appearance did not significantly contribute [ $b = 0.25, t(189) = 1.48, p = .141$ ].

Table 14

*Mediated Moderation Model Summary for Caucasian Sample (N = 190)*

Outcome Variable	R	R <sup>2</sup>	Variables Entered	b	SE b	t	p-value	95% CI	
								Lower Limit	Upper Limit
SPACS	.514	.265	Constant	-2.10	0.77	-2.72	.007	-3.63	-0.57
			BMI	0.10	0.04	2.72	.007	0.03	0.16
			SATAQ-IG	0.30	0.09	3.53	<.001	0.13	0.47
			Condition	-0.11	0.12	-0.92	.356	-0.36	0.13
			OBCSS	0.15	0.07	2.06	.040	0.007	0.29
			ConditionxOBCSS	0.21	0.11	1.85	.065	-0.01	0.43
BISS	.607	.368	Constant	-0.69	1.16	-0.59	.554	-2.99	1.61
			BMI	0.20	0.05	3.82	<.001	0.09	0.31
			SATAQ-IG	0.31	0.13	2.32	.022	0.04	0.56
			Condition	-0.22	0.18	-1.19	.234	-0.58	0.14
			OBCSS	0.34	0.11	3.11	.002	0.10	0.31
			SPACS	0.25	0.17	1.48	.141	-0.08	0.57
			ConditionxOBCSS	0.29	0.11	2.00	.048	0.04	0.47

*Note:* BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; SPACS = State Downward Physical Appearance Comparison Scale; ConditionxOBCSS = interaction between Condition and Objectified Body Consciousness Scale Surveillance Subscales; BISS = Body Image States Scale



As in Study 1, strategies recommended by both Muller et al. (2005) and Hayes (2012) to demonstrate mediated moderation are presented below. Only one of the four necessary conditions outlined by Muller et al. (2005) to demonstrate mediated moderation was met. First, the coefficient for the moderation effect in the first regression equation was significant, indicating that the interaction between study condition and body surveillance significantly predicted state body dissatisfaction. Second, the coefficient for the interaction term in the second regression was not significant, indicating that the interaction between study condition and body surveillance did not significantly predict state downward physical appearance comparison, the mediator. Third, the coefficient for the mediator term in the third equation was not significant, indicating that state downward physical appearance comparison did not significantly predict state body dissatisfaction, while controlling for the interaction. Finally, the coefficient for the interaction term between predictor and moderator variables in the third regression equation was not reduced in magnitude compared to the overall moderation effect assessed in the first regression equation. Further, the indirect effect of the interaction through the mediator was not significant {indirect effect = .054, 95% CI [-.003, .161]}. Thus, using both approaches, mediated moderation was not demonstrated in the Caucasian-only sample and Hypothesis 2 was not supported.

**Moderation analysis for figure rating discrepancy.** The assumptions for multiple regression were assessed as above. The assumptions of multicollinearity, independence of errors, normal distribution of errors, homoscedasticity and linearity were all satisfied. One residual outlier was identified. However, removing this case did not impact the results of the final model. Thus, it was retained in the final analysis. No other outliers or influential cases were identified. Finally, no suppressor variables were

identified in the final model presented below.

The PROCESS macro for Model 1 was used to test Hypothesis 3, with figure rating discrepancy as the criterion variable. BMI and internalized thin ideals were included as significant covariates. Study condition was the independent variable and body surveillance was the moderator variable. The interaction term between study condition and body surveillance was then computed using the PROCESS macro. To aid interpretation, the moderator variable was centered prior to calculating the interaction term (Cohen et al., 2003). Table 15 provides a summary of the final model. The model was significant,  $F(5, 184) = 16.81, p < .001$ , accounting for 31.36% of the variance in figure rating discrepancy. Both covariates significantly contributed to the model ( $ps < .001$ ). Neither study condition [ $b = -0.07, t(189) = -0.59, p = .556$ ] nor body surveillance [ $b = 0.08, t(189) = 1.16, p = .248$ ] was significant. Finally, the interaction between study condition and body surveillance did not significantly contribute to the model,  $b = 0.08, t(189) = 0.76, p = .446$ . Thus, Hypothesis 3 was not supported.

Finally, Hypothesis 4 was assessed by examining the bivariate correlation between state downward physical appearance comparison and figure rating discrepancy. Contrary to prediction, these two variables were negatively correlated, indicating that greater downward appearance comparison was related to a smaller discrepancy between current body size and an “obese norm.”

Table 15

*Moderation Model Summary Predicting Figure Rating Discrepancies for Caucasian*

*Sample (N = 190)*

<i>R</i>	<i>R</i> <sup>2</sup>	Variables Entered	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>p</i> -value	95% CI	
							Lower Limit	Upper Limit
.560	.314	Constant	-3.37	0.77	-4.40	<.001	-4.88	-1.86
		BMI	0.19	0.03	5.55	<.001	0.12	0.26
		SATAQ-IG	0.30	0.08	3.51	<.001	0.13	0.46
		Condition	-0.07	0.12	-0.59	.556	-0.31	0.17
		OBCSS	0.08	0.07	1.16	.248	-0.06	0.23
		ConditionxOBCSS	0.08	0.11	0.76	.446	-0.13	0.30

*Note:* BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; ConditionxOBCSS = interaction between Condition and Objectified Body Consciousness Scale Surveillance Subscale

**Analyses for Full Ethnically Heterogeneous Sample**

**Data preparation.** All data preparation steps presented for the main analyses were repeated for the full ethnically heterogeneous sample. Four participants failed the validity indicators for the study, leaving a final sample size of  $N = 269$ . A missing values analysis was conducted on data from valid responders to assess for patterns of missingness. Eighty-one percent ( $n = 218$ ) of participants provided complete data. The percentage of missing values for all measure items ranged from 0 to 1.5%. Finally, less than 1% of all possible values were missing. Little's MCAR test was not significant,  $\chi^2(4562) = 4640.22, p = .206$ , indicating that the data were missing completely at random. Expectation maximization was used to replace missing values.

**Assumptions of multiple regression.** Assumption analyses for multiple regression were repeated on the full sample. The assumptions of multicollinearity, independence of errors, normal distribution of errors, homoscedasticity and linearity were all satisfied.

Four univariate outliers were identified (1 on body surveillance, 1 on OPTSneg, and 2 on APTSneg) and replaced with the next closest value in the dataset (Tabachnick & Fidell, 2007). Although one residual outlier was identified, its removal did not impact the results of the model and thus was retained in the final analysis. No multivariate outliers or influential cases were identified. Finally, structure coefficients were examined for all variables included in the final regressions (Courville & Thompson, 2001). Based on these coefficients, no suppressor variables were identified in the final models presented below.

All zero order correlations for the full sample are presented in Table 16. Means and standard deviations for all variables, grouped by condition, are presented in Table 17.

A series of independent sample *t*-tests found no significant differences across the two conditions on the predictor variables, with the exception of internalized thin ideals. Thus, randomization to experimental condition was mostly successful. Given this, only internalized thin ideals were controlled for in the final regression models. Further, the OPTSneg and APTSneg were examined to assess the success of the manipulation. Independent sample *t*-tests were conducted. As expected, participants in the support condition reported higher percentages on the OPTSneg than did participants in the challenge condition. Further, greater fat stereotypes were endorsed in the support condition than in the challenge condition for both higher and lower body surveillance women. Additionally, there was no significant difference on the APTSneg between conditions at both higher and lower body surveillance, indicating that the manipulation was specific to beliefs about obese persons only. Thus, the manipulation was successful in the full sample.

**Moderation analysis for state body dissatisfaction.** The first multiple regression assessed Hypothesis 1 for the full sample, with state body dissatisfaction as the criterion variable. The PROCESS macro for Model 1 was used for this analysis. In this regression, internalized thin ideal was included as a significant covariate. Study condition was the independent variable, and body surveillance was the moderator variable. The interaction term between study condition and body surveillance was then computed using the PROCESS macro. To aid interpretation, the moderator variable was centered prior to calculating the interaction term (Cohen et al., 2003).

Table 16

*Zero-Order Correlations Between All Variables for Full Sample (N = 269).*

Variables	1	2	3	4	5	6	7	8	9	10	11
1. MCSDS-C	-										
2. RSES	.35**	-									
3. BDI-II	-.36**	-.75**	-								
4. BMI	-.11	-.07	.06	-							
5. SATAQ-IG	-.28**	-.30**	.27**	.24**	-						
6. OBCSS	-.27**	-.32**	.31**	.20**	.64**	-					
7. FRS	.23**	.20**	-.18**	-.53**	-.24**	-.23**	-				
8. OPTSneg	-.18**	-.04	.08	.09	.20**	.24**	-.01	-			
9. APTSneg	-.14*	-.05	.04	.15*	.07	.07	-.14*	.45**	-		
10. SPACS	-.27**	-.28**	.27**	.25**	.40**	.34**	-.25**	.17**	.08	-	
11. BISS	-.24**	-.48**	.42**	.34**	.44**	.44**	-.50**	.07	.05	.40**	-

*Note:* \*  $p < .05$ , \*\*  $p < .01$ ; MCSDS-C = Marlowe Crowne Social Desirability Scale Form C; RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; FRS = Figure Rating Scale; OPTSneg = Obese Persons Trait Survey negative traits; APTSneg = Average-Weight Persons Trait Survey negative traits; SPACS = State Downward Physical Appearance Comparison Scale; BISS = Body Image States Scale

Table 17

*Descriptive Statistics by Condition for Full Sample (N = 269)*

Variable	Support condition ( <i>n</i> = 133)			Challenge condition ( <i>n</i> = 136)		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
MCSDS-C	6.46	2.86	0.00 – 13.00	6.59	2.92	1.00 – 12.00
RSES	19.28	6.06	6.00 – 30.00	18.65	6.02	5.00 – 30.00
BDI-II	14.16	10.54	0.00 – 47.00	14.06	10.77	0.00 – 49.00
BMI	22.04	1.84	18.55 – 24.99	21.62	1.71	18.50 – 24.96
SATAQ-IG*	3.22	0.89	1.00 – 5.00	2.96	1.01	1.00 – 5.00
OBCSS	4.73	1.04	1.88 – 7.00	4.60	1.10	1.88 – 6.63
FRS	4.20	1.11	2.00 – 7.00	4.24	1.10	2.00 – 7.00
OPTSneg**	58.84	14.26	16.40 – 95.00	52.81	15.69	12.30 – 100.00
APTSneg	47.67	12.03	6.70 – 78.03	47.32	13.55	6.40 – 82.50
SPACS	2.48	0.98	1.00 – 5.00	2.44	0.87	1.00 – 5.00
BISS	3.77	1.63	0.00 – 7.50	3.73	1.46	0.83 – 7.17

*Note:* mean differences between groups denoted by \*  $p < .05$ , \*\*  $p < .01$ . MCSDS-C = Marlowe Crowne Social Desirability Scale Form C; RSES = Rosenberg Self-Esteem Scale; BDI-II = Beck Depression Inventory-II; BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; FRS = Figure Rating Scale; OPTSneg = Obese Persons Trait Survey negative traits; APTSneg = Average-Weight Persons Trait Survey negative traits; SPACS = State Downward Physical Appearance Comparison Scale; BISS = Body Image States Scale

Table 18 provides a summary of the final model. The model was significant,  $F(4, 264) = 21.29, p < .001$ , accounting for 24.39% of the variance in state body dissatisfaction. Internalized thin ideals significantly contributed to the model ( $p < .001$ ). Study condition was not significant,  $b = -0.12, t(268) = -0.74, p = .463$ . However, body surveillance was a significant predictor,  $b = .39, t(268) = 3.85, p < .001$ . Finally, adding the interaction term did not significantly improve the prediction of body dissatisfaction,  $F_{\text{change}}(1, 264) = 2.95, p = .087$ , accounting for an additional 0.85% of the variance. As predicted, the interaction between study condition and body surveillance did not significantly contribute to the model in the full sample,  $b = 0.21, t(268) = 1.72, p = .087$ . Because the interaction was not significant, the specific effect of study condition on state body dissatisfaction at varying levels of body surveillance was not examined.

**Mediated moderation analysis for ethnically heterogeneous sample.** Similar to the Caucasian-only analysis, three regression models were estimated to test for mediated moderation. The first regression was identical to the moderated multiple regression outlined above, testing the moderation effect on state body dissatisfaction as the criterion variable. The second regression equation tested the moderation effect on the mediator variable, state downward physical appearance comparison. Finally, the third regression equation tested the mediator's partial effect on state body dissatisfaction while controlling for the interaction between the predictor and moderator variables.



Table 18

*Moderation Model Summary Predicting Body Dissatisfaction for Full Sample (N = 269)*

<i>R</i>	<i>R</i> <sup>2</sup>	Variables Entered	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>p</i> -value	95% CI	
							Lower Limit	Upper Limit
.545	.297	Constant	2.35	0.36	6.60	<.001	1.65	3.06
		SATAQ-IG	0.45	0.11	4.00	<.001	0.23	0.67
		Condition	-0.12	0.17	-0.74	.463	-0.45	0.20
		OBCSS	0.39	0.10	3.85	<.001	0.19	0.58
		ConditionxOBCSS	0.21	0.16	1.72	.087	-0.04	0.57

*Note:* BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; ConditionxOBCSS = interaction between Condition and Objectified Body Consciousness Scale Surveillance Subscale

The PROCESS macro for Model 8 again was used to examine the second and third regressions. The statistical diagram is depicted in Figure 7. The second regression equation tested the moderation effect on the mediator variable, state downward physical appearance comparison. As above, internalized thin ideal was included as a covariate. Table 19 provides a summary of the final model for this second regression. The model was significant,  $F(4, 264) = 15.26, p < .001$ , accounting for 18.78% of the variance in state downward physical appearance comparison. Internalized thin ideal significantly contributed to the model ( $p < .001$ ). Study condition was not significant,  $b = -0.08, t(268) = -0.80, p = .426$ . However, body surveillance was a significant predictor,  $b = .19, t(268) = 1.99, p = .048$ . Finally, the interaction between study condition and body surveillance was not significant,  $b = 0.11, t(268) = 1.75, p = .081$ . Because the interaction was not significant, the specific effect of study condition on downward comparison at varying levels of body surveillance was not examined.

Table 19 also provides a summary of the third regression equation examining the partial effect of state downward physical appearance comparison on state body dissatisfaction, while controlling for the interaction. The model was significant,  $F(5, 263) = 21.19, p < .001$ , accounting for 28.72% of the variance in state body dissatisfaction. Internalized thin ideal significantly contributed to the model ( $p = .01$ ). Study condition was not significant,  $b = -0.16, t(268) = -1.01, p = .314$ . However, body surveillance was a significant predictor,  $b = .32, t(268) = 3.36, p < .001$ . Though the interaction between study condition and body surveillance did not significantly contribute to the model [ $b = 0.17, t(268) = 1.14, p = .255$ ], state downward physical appearance comparison was significant [ $b = 0.32, t(268) = 3.40, p < .001$ ].

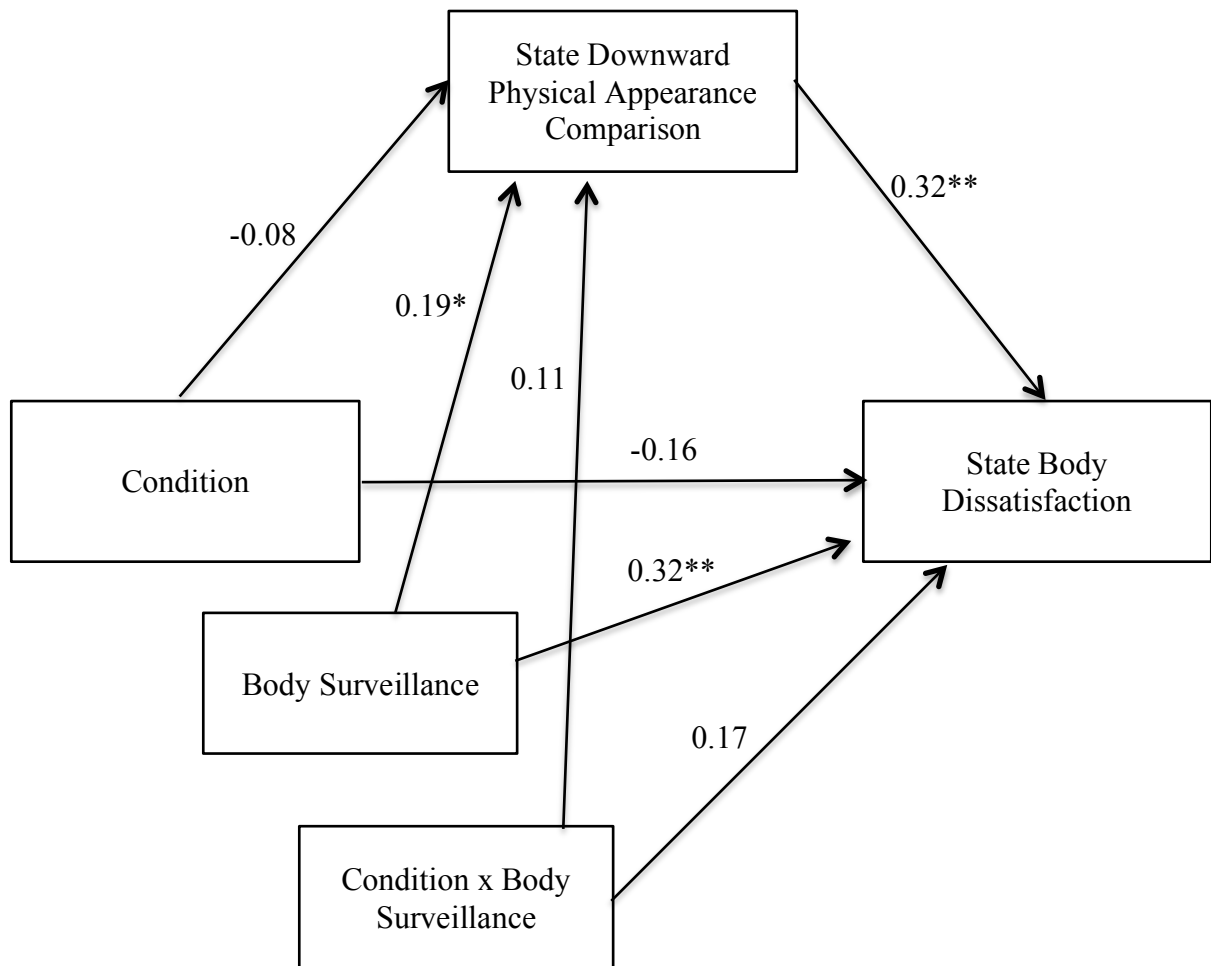


Figure 7. Statistical diagram for predicted mediated moderation model for full sample in Study 2. Regression coefficients are presented. \*  $p < .05$ , \*\*  $p < .01$

Table 19

*Mediated Moderation Model Summary for Full Sample (N = 269)*

Outcome Variable	R	R <sup>2</sup>	Variables Entered	b	SE b	t	p-value	95% CI	
								Lower Limit	Upper Limit
SPACS	.433	.188	Constant	-0.22	0.65	-0.30	.763	-1.48	1.09
			SATAQ-IG	0.29	0.07	4.16	<.001	0.15	0.43
			Condition	-0.08	0.10	-0.80	.426	-0.28	0.12
			OBCSS	0.19	0.10	1.99	.048	0.002	0.38
			ConditionxOBCSS	0.11	0.06	1.75	.081	-0.01	0.23
BISS	.536	.287	Constant	-1.87	1.00	-1.86	.064	-3.85	0.11
			SATAQ-IG	0.29	0.11	2.59	.010	0.07	0.51
			Condition	-0.16	0.15	-1.01	.314	-0.47	0.15
			OBCSS	0.32	0.10	3.36	<.001	0.13	0.51
			SPACS	0.32	0.09	3.40	<.001	0.14	0.51
			ConditionxOBCSS	0.17	0.15	1.14	.255	-0.12	0.46

*Note:* SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; SPACS = State Downward Physical Appearance Comparison Scale; ConditionxOBCSS = interaction between Condition and Objectified Body Consciousness Scale Surveillance Subscales; BISS = Body Image States Scale

Only one of the conditions outlined by Muller et al. (2005) to demonstrate mediated moderation was met. The regression coefficient for the overall moderation effect in the first regression equation was not significant, indicating that the interaction between study condition and body surveillance did not significantly predict state body dissatisfaction. Further, the regression coefficient for the interaction term in the second regression equation was not significant, indicating that the interaction between study condition and body surveillance did not predict state downward physical appearance comparison, the mediator. However, the regression coefficient for the mediator term in the third equation was significant, indicating that state downward physical appearance comparison significantly predicted state body dissatisfaction, while controlling for the interaction. Finally, the regression coefficient for the interaction term between predictor and moderator variables in the third regression equation was not reduced in magnitude compared to the overall moderation effect assessed in the first regression equation, given that both were not significant. Further, the indirect effect of the interaction through the mediator was not significant {indirect effect = .035, 95% CI [-.001, .153]}, as outlined by Hayes (2012). Thus, mediated moderation was not demonstrated in the full ethnically heterogeneous sample.

**Moderation analysis for figure rating discrepancy in ethnically heterogeneous sample.** The assumptions for multiple regression were assessed as above. The assumptions of multicollinearity, independence of errors, normal distribution of errors, homoscedasticity and linearity were all satisfied. Two residual outliers were identified. However, removing these cases did not impact the results of the final model. Thus, they were retained in the final analysis. No other outliers or influential cases were

identified. Finally, no suppressor variables were identified in the final model presented below.

The PROCESS macro for Model 1 was used to test Hypothesis 3, with figure rating discrepancy as the criterion variable. Internalized thin ideal was included as significant covariates. Study condition was the independent variable, and body surveillance was the moderator variable. The interaction term between study condition and body surveillance was then computed using the PROCESS macro. To aid interpretation, the moderator variable was centered prior to calculating the interaction term (Cohen et al., 2003).

Table 20 provides a summary of the final model. The model was significant,  $F(4, 264) = 12.56, p < .001$ , accounting for 15.99% of the variance in figure rating discrepancy. Internalized thin ideal significantly contributed to the model ( $p < .001$ ). Though study condition was not significant [ $b = -0.01, t(268) = -0.07, p = .941$ ], body surveillance did significantly contribute to the model [ $b = 0.15, t(268) = 2.06, p = .040$ ]. Finally, the interaction between study condition and body surveillance did not significantly contribute to the model,  $b = 0.12, t(268) = 1.01, p = .311$ . Thus, Hypothesis 3 was not supported.

Finally, Hypothesis 4 was assessed by examining the bivariate correlation between state downward physical appearance comparison and figure rating discrepancy. These two variables were negatively correlated, indicating that greater downward appearance comparison was related to a smaller discrepancy between current body size and an “obese norm.”

Table 20

*Moderation Model Summary Predicting Figure Rating Discrepancies for Full Sample (N = 269)*

<i>R</i>	<i>R</i> <sup>2</sup>	Variables Entered	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>p</i> -value	95% CI	
							Lower Limit	Upper Limit
.399	.160	Constant	-0.16	0.26	-0.60	.549	-0.67	0.36
		SATAQ-IG	0.32	0.08	3.90	<.001	0.16	0.48
		Condition	-0.01	0.12	-0.07	.941	-0.25	0.23
		OBCSS	0.15	0.07	2.06	.040	0.01	0.29
		ConditionxOBCSS	0.12	0.11	1.01	.311	-0.11	0.34

*Note:* BMI = Body Mass Index; SATAQ-IG = Sociocultural Attitudes Towards Appearance Scale-3 Internalization General subscale; OBCSS = Objectified Body Consciousness Scale Surveillance subscale; ConditionxOBCSS = interaction between Condition and Objectified Body Consciousness Scale Surveillance Subscale

### **Study 2: Discussion**

The first aim of Study 2 was to examine the causal role of fat stereotype endorsement on body dissatisfaction. Participants' level of fat stereotype endorsement was manipulated by presenting information that either challenged or supported these stereotypes. As mentioned, the manipulation check confirmed that participants in the support condition endorsed greater fat stereotypes than did women in the challenge condition. Though successful, it appears that the manipulation might have had more than one effect. These alternatives, including changes in fat stereotypes as well as changes in beliefs about weight controllability, will be discussed below as they pertain to the study.

As predicted in Hypothesis 1, body surveillance moderated the relationship between study condition (challenge vs. support) and state body dissatisfaction in Caucasian women. This interaction was not observed in the ethnically heterogeneous sample. Contrary to expectation, however, Caucasian women with lower body surveillance reported higher state body dissatisfaction in the challenge condition compared to those in the support condition. Women with higher body surveillance did not differ in their reports of body dissatisfaction depending on study condition, despite the success of the manipulation in influencing fat stereotypes. These results indicate that for Caucasian normal weight women with greater body surveillance, their higher levels of body dissatisfaction are not impacted by changes in their fat stereotypes. This suggests that their critical appraisals of their body are not influenced by changes in their beliefs about others. Because of their high focus on their body, they may be acutely aware of the aspects of their body with which they are dissatisfied. Despite reading about the complex nature of weight, including factors that are uncontrollable by any one individual, these



women remain displeased with their body. Further, because appearance is an important domain for women with higher body surveillance, it is likely that they previously have sought out and consumed information contained within the mock health reports. Thus, it is possible that the manipulation had less of an impact on state body dissatisfaction in these women due to the familiarity of the information.

For Caucasian normal weight women with lower body surveillance, increasing fat stereotypes appears to reduce body dissatisfaction compared to decreasing fat stereotypes. This was contrary to expectation. One potential interpretation of this finding is that for these women who monitor their body less frequently, increasing disparaging beliefs about overweight and obese individuals might directly improve appraisals of their own body. However, the findings presented in Study 1 challenge this interpretation, given that greater fat stereotype endorsement was related to greater body dissatisfaction in women with lower body surveillance. Presumably, greater fat stereotype endorsement would have been related to lower body dissatisfaction in Study 1 if this interpretation were correct. Other possible explanations are presented below.

### **Downward Physical Appearance Comparison as an Explanatory Mechanism**

The second purpose of Study 2 was to examine downward physical appearance comparison as an explanation for the moderated effect. For both the full ethnically heterogeneous sample and the Caucasian-only sample, the necessary conditions to demonstrate mediated moderation were not satisfied. Specifically, the interaction did not significantly predict state downward physical appearance comparison. In other words, manipulating fat stereotypes did not differentially impact state downward physical appearance comparison in women with higher or lower levels of body surveillance. In the

Caucasian sample, state downward physical appearance comparison also did not significantly predict state body dissatisfaction, while controlling for the interaction. Thus, state downward physical appearance comparison was not the mechanism through which the interaction between study condition and body surveillance impacted body dissatisfaction. This further indicates that for women with lower body surveillance, changes in their body dissatisfaction could not be explained by changes in their level of downward comparison.

### **Possible Role of Locus of Control?**

Another possible explanation for this finding in lower surveillance women, however, pertains to locus of control. Locus of control refers to an individual's general expectations about whether outcomes in their lives are the result of their own behaviours and characteristics (internal locus of control) or the result of external factors such as luck, chance, or the influence of powerful others (external locus of control; Rotter, 1966). This theory has been extended into the domain of body image, with research suggesting that locus of control is related to levels of body dissatisfaction (e.g., Monteath & McCabe, 1997). Indeed, Laliberte et al. (2007) found that beliefs in one's ability to control a healthy lifestyle (i.e., engage in healthy behaviours) and to accept one's natural body were related to lower body dissatisfaction and greater self-esteem. In the current study, reading about controllable causes of obesity, such as dietary intake and activity levels, could have resulted in an increase in participants' internal locus of control over their lifestyle. This information might have affirmed in these normal weight women that they are engaging in appropriate weight management behaviours, leading to feelings of empowerment over their appearance, and more favourable appraisals of their body. This

positive response to controllable factors associated with weight seems likely for this group of women who are not highly critical of, or focussed on, their body.

In contrast, reading about the uncontrollable causes of weight might have framed one's body from an external locus of control perspective. In this case, these participants with lower body surveillance may have felt incapable of making changes to their body, leading to more body dissatisfaction. This is consistent with past research findings indicating that women with characteristically high external locus of control report greater body dissatisfaction (e.g., Furnham & Greaves, 1994; Garner et al., 1976), and tend to overestimate their body size to a greater extent than do women with an internal locus of control (Garner et al., 1976). These authors have suggested that women who have an external locus of control may feel powerless to alter their body, leading to more distorted perceptions and negative appraisals about their body (Monteath & McCable, 1997).

For higher body surveillance women, body dissatisfaction was unaffected by the type of information presented. Though a sense of control over one's life generally is associated with mental well-being, some authors have cautioned against the assumption that internal attributions invariably have a positive impact (e.g., Strickland, 1978). Having inflexible or excessive expectations for control may result in harmful outcome. Of particular relevance is that women with anorexia nervosa, an eating disorder characterized by dietary restraint, extreme weight control behaviours, and high body monitoring, have been shown to have strong internal locus of weight control (i.e., the belief that their body weight is entirely within their control; Watt, Sharp, & Atkins, 2002). Further, Laliberte et al. (2007) found that strong body weight control beliefs, but not lifestyle control beliefs, were related to higher body dissatisfaction in women. It is

theorized that holding beliefs in the controllability of one's body weight leads to body dissatisfaction when one does not meet their high standards of appearance. Because women with higher body surveillance are body-focussed and tend to internalize the thin ideal, they may be more likely to hold strong weight control beliefs rather than beliefs about lifestyle control and body acceptance. Thus, it is possible that regardless of the information presented, women with higher surveillance continue to hold strong weight control beliefs and report greater body dissatisfaction due to the unattainable nature of their appearance standards. Future studies could empirically assess this explanation by measuring internal versus external locus of control in the domains of body weight and lifestyle beliefs after presenting information about the determinants of weight. The relationship between these beliefs and body dissatisfaction in women with varying levels of body surveillance could then be examined. For women with lower body surveillance, it is possible that presenting information about the controllable causes of weight would heighten an internal locus of control in the domain of lifestyle beliefs compared to presenting information about the uncontrollable causes of weight, thus resulting in lower body dissatisfaction. For women with higher body surveillance, higher levels of internal locus of control in the domain of weight control beliefs would be expected regardless of the information presented, thus contributing to their consistently greater levels of body dissatisfaction.

### **Figure Rating Discrepancies as Indicator of Contrast vs. Assimilation Effects**

Another purpose of this study was to use the figure rating scale as a measure of contrast versus assimilation effects in the domain of appearance-based comparison. It was predicted that women with higher body surveillance would report a greater degree of

contrast in the support condition than in the challenge condition, representing a contrast effect. Conversely, it was expected that women with lower body surveillance would report a smaller degree of contrast in the support condition than in the challenge condition, representing an assimilation effect. Contrary to prediction, however, level of body surveillance did not moderate the impact of study condition on the degree of contrast between current body size and an “obese norm.” Given that this hypothesis was grounded in Social Comparison Theory, this non-significant observation is consistent with the absence of a moderated effect on downward physical appearance comparison, discussed above.

It was assumed that if downward physical appearance comparison generally functions by producing contrast effects, a greater discrepancy between the current self and a standard obese norm on the figure rating scale would be reported. However, figure rating discrepancy and downward physical appearance comparison were negatively correlated. This indicates that greater downward appearance comparison was related to a smaller discrepancy between current body size and an “obese norm.” In other words, the more participants compared themselves to less attractive targets, the more similarly they rated their body size to that of an obese norm. Further, downward physical appearance comparison was positively correlated with BMI, suggesting that with increasing body size, women were more likely to compare themselves to people perceived to be less attractive. At the same time, BMI and body dissatisfaction were negatively correlated with figure rating discrepancy. This indicates that with increasing body size, women rated their body more similarly to that of an obese norm and reported greater body dissatisfaction. Taken together, these findings suggest that with increasing body size,

women are more likely to compare themselves to people perceived to be less attractive. This comparison process leads to an assimilation effect rather than a contrast effect (i.e., rating one's body as more similar to an obese norm), and thus, greater reports of body dissatisfaction.

## Chapter IV

### **General Discussion**

The purpose of this research was to extend the knowledge on the interactive impact of fat stereotype endorsement and body surveillance in normal weight women. In particular, these studies focussed on the relationship between fat stereotype endorsement and body dissatisfaction at varying levels of body surveillance. The second purpose of this research was to examine a mediated moderation model in which downward physical appearance comparison was tested as an explanatory mechanism for the predicted moderation effect.

Generally, it was expected that greater fat stereotype endorsement would be related to lower body dissatisfaction in normal weight women with higher levels of body surveillance. In normal weight women with lower levels of body surveillance, it was expected that greater fat stereotype endorsement would be related to higher body dissatisfaction. Based on the findings reported by Kim and Jarry (2014), this moderation effect was expected in Caucasian women only. In Study 1, this hypothesis was examined through a correlational design. Body surveillance was observed to significantly moderate the relationship between fat stereotype endorsement and body dissatisfaction. However, the hypothesis was only partially supported. For Caucasian normal weight women with lower body surveillance, fat stereotype endorsement was positively related to body

dissatisfaction. For women with higher body surveillance, fat stereotype endorsement was not significantly related to body dissatisfaction. In Study 2, this hypothesis was examined through an experimental design. Again, body surveillance significantly moderated the relationship between study condition (challenge versus supporting fat stereotypes) and state body dissatisfaction. Contrary to expectation, however, Caucasian normal weight women with lower body surveillance reported less body dissatisfaction when exposed to information depicting body weight as controllable than when exposed to information portraying weight as largely uncontrollable. Consistent with the results of Study 1, there were no significant differences in reported body dissatisfaction across conditions for normal weight women with higher body surveillance.

Both studies also examined downward physical appearance comparison as a potential mechanism through which the interaction between fat stereotype endorsement and body surveillance influenced body dissatisfaction. This mediated moderation model was not supported in either study. In Study 1, body surveillance did not moderate the relationship between fat stereotype endorsement and downward physical appearance comparison. Further, the indirect effect of the interaction between fat stereotype endorsement and body surveillance through downward physical appearance comparison was not significant. Similarly in Study 2, body surveillance did not moderate the relationship between study condition and downward physical appearance comparison. Further, the indirect effect of the interaction between study condition and body surveillance through downward physical appearance comparison was not significant. Finally, in both studies, downward physical appearance comparison was not significantly correlated with body dissatisfaction while accounting for the interaction in the Caucasian

sample. These findings indicate that downward physical comparison is not an explanatory mechanism for the observed interaction between fat stereotype endorsement and body surveillance in normal weight women.

### **Higher Body Surveillance: Possible Role of Body Positivity Messaging**

The findings across both studies suggests that for Caucasian normal weight women with higher body surveillance, body dissatisfaction is resistant to changes in, or varying levels of, their fat stereotype endorsement. These women made highly negative appraisals of their body regardless of their level of endorsement of fat stereotypes. This was in contrast to the previous finding by Kim and Jarry (2014), in which high body surveillance women reported significantly lower body dissatisfaction with increased fat stereotypes. Further replication is needed to confirm whether or not fat stereotype endorsement and body dissatisfaction are related in higher body surveillance women. It is notable, however, that higher body surveillance was related to greater body dissatisfaction, lower self-esteem, and higher depressive symptoms in both studies. This suggests that the tendency to monitor and look at one's body is detrimental not only to body satisfaction, but also to general well being.

One possible explanation for the difference in findings between the current studies and the Kim and Jarry (2014) study for higher surveillance women may be the recent proliferation of body acceptance and body positivity messaging in both traditional and social media platforms. Originally launched in 2004, The Dove Real Beauty Campaign (Unilever, 2017) celebrated natural physical variations in women and promoted body acceptance. In 2012, this messaging gained momentum under the label of “the body positivity movement”, and received widespread support through social media



and celebrity endorsement (Sastre, 2016). The body positivity movement challenged traditional ideals of beauty, advocated for new beauty norms that promote the acceptance of diverse body types, and attempted to shift the strong association between health and the thin ideal (Bacon, 2010; Sastre, 2016). Over the past several years, body positivity and body acceptance have become a new social norm, and likely have impacted self-reported body appraisal in women (Sastre, 2016). Notably, the timing of this movement coincided with the four-year gap between the current research and the original Kim & Jarry (2014) study. Further, the relationship between fat stereotypes and body dissatisfaction was in the expected direction for women with higher body surveillance in Study 1, though not significant. It is possible that exposure to these messages over the past several years could have weakened the impact that fat stereotypes have on body satisfaction in women who are body conscious. Prior to this movement, holding disparaging beliefs about overweight and obese women may have resulted in more favourable appraisals toward one's own body, given the pervasive association between body size and beauty ideals. With the proliferation of the body positivity movement, however, it is possible that these disparaging beliefs are less associated with beauty ideals and thus, have less of an impact on body appraisal. If so, even if one holds these beliefs, they may no longer serve a defensive function against body dissatisfaction in women who are body conscious. Further research is needed to examine this explanation empirically.

#### **Lower Body Surveillance: Activation of State Locus of Control**

For normal weight women with lower body surveillance, the results across Study 1 and Study 2 are less consistent. The finding in Study 1 suggests that greater fat stereotype endorsement exacerbates body dissatisfaction in these women. If these

stereotypes directly impacted body dissatisfaction, however, increasing their endorsement in the support condition of Study 2 logically should have heightened body dissatisfaction. The opposite effect was found. Though the manipulation was successful at increasing fat stereotypes in the support condition, this led to a reduction in reported body dissatisfaction. One possible explanation is that learning about the controllable causes of obesity heightened fat stereotypes and emphasized the contrast between oneself and obese individuals, leading to lower body dissatisfaction. However, this seems unlikely given that the interaction did not significantly predict figure rating discrepancies or downward physical appearance comparison.

As discussed above, another possible explanation is that reading about controllable causes of obesity could have activated an internal locus of control over one's lifestyle and body, leading to subsequent reductions in body dissatisfaction. In contrast, reading about the uncontrollable causes of obesity could have activated an external locus of control, thus leading to increases in body dissatisfaction. This is despite the fact that the manipulation was successful in changing fat stereotype endorsement. This suggests that body dissatisfaction in normal weight women with lower body surveillance is reactive and sensitive to immediate sources of information. At a neutral position, holding fat stereotypes may be related to higher body dissatisfaction. When presented with information about the causes of obesity, however, it is possible that temporarily activating locus of control overrides the impact that changes in fat stereotypes might have on body dissatisfaction. In other words, the potency of experimentally activating internal versus external locus of control could have masked the effects of increasing fat stereotypes on body dissatisfaction. Future research could focus on changing fat

stereotypes without activating differences in locus of control, and re-examining the impact on body dissatisfaction.

Alternatively, reading about the controllable causes of weight could have changed the direction of the relationship between fat stereotypes and body dissatisfaction in women with lower body surveillance by activating an internal locus of control. This information about weight controllability could have activated beliefs in these women that larger people lack the will power or self-control necessary to regulate weight, while simultaneously affirming that they themselves are engaging in appropriate weight control behaviours, leading to reduced body dissatisfaction. In future studies a measure of locus of control would be required to examine this possibility. This measure could be added to an experimental study presenting information about the controllable and uncontrollable aspects of weight. Changes in the direction of the relationship between fat stereotype endorsement and body dissatisfaction in women with lower body surveillance could then be examined in the context of changes in internal locus of control in a three-way interaction. Based on this interpretation, it would be expected that in women with lower body surveillance and higher internal locus of control, greater fat stereotypes would be related to lower body dissatisfaction. For women with lower body surveillance and lower internal locus of control, greater fat stereotypes could be related to higher body dissatisfaction.

### **Influence of Race and Ethnicity**

Another aspect of this research was to consider the impact of race and ethnicity on the predicted relationships between fat stereotypes and body image. The differences across racial and ethnic groups in their reports of weight stigma and body dissatisfaction

have been outlined above. However, some researchers have suggested that racial and ethnic differences have narrowed as the thin ideal became more ubiquitous. In an attempt to assess whether racial and ethnic differences in weight and body satisfaction remain, Roberts, Cash, Feingold, and Johnson (2006) conducted a meta-analysis of studies from 1966 to 2002 examining body image and race. One reported trend was that differences between Black and White women on measures of weight-satisfaction have diminished over time. In fact, reports of weight satisfaction have become nearly identical across the two groups (e.g., Cash et al., 2004), with Black women becoming increasingly dissatisfied with their weight. In contrast, differences between Black and White women on measures of global body satisfaction have increased over time, with Black women reporting greater satisfaction than do White women. This difference was found to be most pronounced for women in college and in their early 20s, and to dissipate by age 40. Roberts et al. (2006) concluded that the relationship between race and body image is complex and requires ongoing investigation, given that some differences have strengthened over time while others have reduced.

In the current research, greater negative traits were associated with overweight people than with average weight people in both the Caucasian-only and the ethnically heterogeneous samples. However, greater fat stereotypes were reported in the Caucasian-only subsample compared to the full sample in Study 1. These findings suggest that disparaging beliefs toward overweight individuals exist across ethnicities, although these beliefs continue to be more pronounced in Caucasian women. Further, given that the interaction between fat stereotypes and body surveillance significantly impacted body dissatisfaction in Caucasian women only, the current research suggests that racial and

ethnic differences in the *relationship* between body image and weight-stigma variables also continue to exist and to be more pronounced in Caucasian women. Further research focusing on how fat stereotype endorsement may or may not influence body dissatisfaction in women within specific ethnic groups would help to further elucidate the complex nature of body image and weight-based stigma.

### **Clinical and Social Applications**

The results of this research have potential clinical and social applications. In particular, these results have possible implications for treatment programmes that address body-related mental health concerns, such as eating disorders. In eating disorder programmes, treatment tends to involve a component of psychoeducation about the factors contributing to weight. This information tends to overlap with the material presented in the mock health report reviewing uncontrollable determinants of weight in Study 2. For example, Cognitive Behavioural Therapy-Enhanced (CBT-E; Fairburn, 2008) provides psychoeducation about one's natural healthy body weight and uncontrollable reasons for weight fluctuations. Other programmes such as Compassion-Focused Therapy for eating disorders (Goss & Allan, 2010) review set point theory, which highlights the genetic determinants of one's weight range and the evolutionary reasons why it is difficult to lose weight. It is thought that providing this education helps women to have a more objective understanding of their weight and how it is influenced by factors outside of their immediate control. This understanding is expected to reduce the value placed on one's specific weight, and to promote greater acceptance of one's body overall. However, body image disturbances that present in eating disorders are difficult to change, and tend to be highly resistant to intervention (Guarda, 2008; Halmi,

2013). The results of Study 2 confirm that presenting this type of information does not improve body dissatisfaction in women with either lower or higher levels of body surveillance. In women who engage in frequent body monitoring, their body dissatisfaction is unaffected by the information. In women who engage in less body monitoring, the present results suggest that this information might exacerbate body dissatisfaction. Thus, the benefits and potential risks of this component of treatment programmes should be carefully examined to identify for whom this education might be helpful. Further, it is possible that providing education about weight leads to therapeutic benefits other than improvements in body dissatisfaction, such as reduced weight checking or reduced dietary restraint. Dismantling studies could be conducted to assess the utility of this psychoeducational component to achieve clinically significant change, and to further consider the questions of “on what dimensions?” and “for which women?” these interventions may be effective.

Further, interventions targeting the motivations underlying body surveillance may lead to the development of more effective and adaptive strategies to improve body image that is unrelated to weight stigma. For example, rather than over-investing in one’s weight, focusing on positive internal qualities of the self, or on the body’s physical capabilities, could be more adaptive strategies of self-enhancement that also reduce body surveillance. Finally, given that people are inundated with information about weight, and that the results of this study indicate that the type of information presented can differentially impact body satisfaction, another potential direction for clinical programmes addressing body image might be to focus on helping people to develop skills in navigating this information. Though clinical programmes can be selective about the

type of information that is presented within the treatment, the clients inevitably will come across conflicting information outside of the programme. Becoming an active, critical, and conscious consumer of all weight-related messaging could be an important treatment target to improve media literacy as well as body image (Watson & Vaughn, 2006).

This research also has potential implication for weight-bias reduction programmes. As discussed earlier, the body positivity movement has become prolific over the past half-decade. This movement has worked toward body diversity acceptance, ending weight discrimination and stigma, and shifting away from pathologizing specific weights (Association for Size Diversity and Health, 2018). This movement also challenges the assumption that one must be thin in order to be healthy, and instead focuses on “addressing health directly by adopting healthy behaviours” (Bacon, 2018). Similar to the treatment programmes discussed above, this movement presents information about the various determinants of weight, with an emphasis on the genetic and social determinants rather than solely diet and exercise.

The overall goals of these programmes are to reduce weight-based stigma and to promote body acceptance. In terms of weight-bias reduction, the results of Study 2 confirm that presenting information about the uncontrollable determinants of weight is effective at reducing fat stereotypes in women. This is consistent with past findings that education about the genetic and environmental factors of obesity significantly reduces dislike toward obese individuals, and a reduction in the willpower stereotype (O’Brien et al., 2010). These findings suggest that if one’s goal is to induce change in the perception of overweight and obese individuals, presenting this type of information is an effective tool. However, the picture becomes more complicated with the simultaneous goal of

improving body image disturbance. Indeed, the results of the current research suggest that the type of information that is presented differentially impacts body image disturbance in women. As discussed, the findings indicate that education about the uncontrollable determinants of weight might actually exacerbate body dissatisfaction in women who are less body conscious, while education about the topics of diet and exercise can serve to lessen body dissatisfaction. Further, past research has shown that women who engage in dieting behaviours for the purposes of health improvement rather than for weight loss were less appearance conscious, and also reported greater self-esteem and less body dissatisfaction (Putterman & Linden, 2004). This supports the notion that for women who are less body conscious, information about diet and exercise might actually improve body image. In contrast, the results of the current research indicate that for women who are more body conscious, neither information about diet/exercise nor genetic/social determinants of weight are helpful in improving body acceptance. Moreover, past research has shown that focussing on diet (Putterman & Linden, 2004) and exercise (McDonald & Thompson, 1992) for the purposes of weight control leads to body dissatisfaction and eating disturbances in women who are appearance focussed. Taken together, these findings suggest that the information presented in body positivity and body acceptance movements might be successful at reducing weight-bias, but have unique consequences on body image disturbance that are dependent on the consumer of these messages. For women with higher body surveillance, the current research suggests that information about either uncontrollable or controllable causes of weight is unlikely to improve body dissatisfaction. For women with lower body surveillance, information about uncontrollable causes of weight might exacerbate body dissatisfaction while



information about controllable causes might improve it. One strategy to address these different responses may be to provide a balanced and complete picture of the complex nature of weight. Both types of information could be presented by conveying the aspects of weight that one can control (e.g., dietary consumption, activity level), while also reviewing the uncontrollable limitations of these behaviours on weight regulation in order to promote realistic expectations rather than evoking idealized beauty standards. Future research would be required to examine the potential impact that this balanced and nuanced approach would have on both body dissatisfaction and weight-bias.

### **Limitations and Future Directions**

**Sampling limitations.** One general limitation of this research pertains to the recruitment of racially and ethnically diverse participants. The majority of participants in both studies self-identified as Caucasian. Though analyses were conducted on Caucasian participants and then repeated on the full sample, differential analyses between racial and ethnic groups could not be completed due to sample size limitations. As discussed, the significant findings in the Caucasian sample were not replicated in the ethnically heterogeneous sample. Given the differences in body image and weight stigma across racial and ethnic groups described above, future research is needed to elucidate the relationship between fat stereotype endorsement and body dissatisfaction within specific ethnic groups. This also would provide further clarity to the question of whether racial and ethnic differences in body image and weight stigma are narrowing or remaining stable.

Additionally, future research could extend existing knowledge on the relationships between fat stereotypes and body image in overweight and obese

populations. Though the relationship between fat stereotype endorsement and body dissatisfaction is well-documented in overweight and obese individuals (e.g., Carels et al., 2010; Durso & Latner, 2008; Friedman et al., 2005), the potential moderating effect of body surveillance on this relationship could be examined in future research. Further, the impact of presenting information about the controllable versus uncontrollable causes of obesity on overweight and obese women of varying levels of body surveillance could be another avenue for future research. Moreover, the types of information that lead to increases or decreases in body dissatisfaction in overweight women compared to normal weight women, and how this information differentially impacts locus of control, could be examined in future research.

One additional limitation of this research is the lack of information regarding participants' weight history. In future studies, the relationship between weight-based stigma and body image in women who have experienced changes in their weight status over time could be examined. For example, the results of past studies have indicated that women who have changed in weight status from overweight to normal weight experience greater overweight preoccupation and body image concerns than do women who have been stable in their normal weight status (e.g., Annis, Cash, & Hrabosky, 2004; Cash, Counts, Huffine, 1990). Further, the heightened level of body image concerns in women who were previously overweight are comparable to that reported by currently overweight women (Annis et al., 2004). Additionally, women who have undergone weight loss surgery report continued high negative self-evaluations, including body image distortions, body dissatisfaction, and perceived fat stigma, despite significant weight loss (Alegria & Larsen, 2015). Taken together, these findings suggest that the relationship

between weight-based stigma and body image could be stronger in women with a history of overweight but who are currently average weight, particularly given that internalized fat stigma is commonly reported amongst overweight individuals (e.g., Carels et al., 2010). Women who have experienced such changes in their weight status could continue to carry this internalized stigma, making them potentially more vulnerable to body image concerns. Extending this notion, longitudinal examination of how changes in weight status impact the relationship between fat stereotypes and body satisfaction over time could be conducted in future studies.

Given the aforementioned sampling limitations, one interesting avenue for future research could be to examine how the relationships between weight-based stigma, body surveillance, and body dissatisfaction differ between specific ethnic groups across weight classification categories. Notably, past findings suggest that White women tend to experience body dissatisfaction at lower BMI levels than do Black or Hispanic women (e.g., Fitzgibbon, Blackman, & Avellone, 2000; Smith, Thompson, Raczynski, & Hilner, 1999). Further, perceiving oneself as being overweight, whether correctly or incorrectly based on objective BMI, tends to be more common among White women compared to Black or Hispanic women (Paeratakul et al., 2002). These findings suggest the possibility that the relationship between weight-based stigma and body image are unique to specific combinations of ethnicity and weight-based classifications. For example, given the findings outlined above, it is possible that the relationship between weight-based stigma and body satisfaction for overweight Black women may be weaker than in overweight or normal weight White women, but stronger than in normal weight Black women. In future research, these relationships could be examined in increasingly specific groups of women

to capture more accurately their unique experiences of weight stigma and body image.

**Fat stereotype endorsement versus anti-fat attitudes.** The focus of the current research was to examine the extent to which people endorsed negative traits associated with overweight and obese individuals. This was selected specifically due to the important role of stereotypes in the development and expression of prejudicial attitudes (Crandall, 1994). The current findings could be expanded in future studies by examining how anti-fat attitudes, such as feelings of dislike or disgust toward overweight individuals, are related to body dissatisfaction in normal weight women. It is possible that anti-fat attitudes have a more potent effect on body image than does fat stereotype endorsement. This remains an empirical question that requires future investigation.

**Fat stereotype manipulation and locus of control measurement.** One limitation for Study 2 is the possibility that the manipulation not only impacted fat stereotype endorsement, but also activated differences in locus of control. As discussed, the latter may have overridden or nullified the effects of fat stereotypes. Two possible avenues of future research could help to provide clarity. One possibility is to apply a more direct manipulation of fat stereotype endorsement by falsely telling participants that larger people possess the traits represented in either negative or positive stereotypes, though careful ethical consideration would be needed on how this might be done. Another possibility is to include measures of locus of control (e.g., weight control beliefs versus lifestyle control beliefs) to identify any changes and examine their impact on body dissatisfaction. Locus of control either could be a variable of interest, or could be considered as a covariate. Regardless, one limitation of Study 2 was that changes in these beliefs were not operationalized and measured.

**Other effects of fat stereotype manipulation?** Another limitation of the current research is that additional possible outcomes of manipulating fat stereotypes were not measured. For example, the impact of weight education on discriminatory behaviour as a dependent variable, and whether differences in body surveillance moderate these effects, could be examined in future studies. It is possible that women with lower body surveillance are less likely to engage in discriminatory behaviour after reading information that decreases fat stereotypes compared to information that increases these stereotypes, while this behaviour may be unaffected in women with higher body surveillance. This potential avenue for future research would be particularly interesting given the current social climate of body diversity acceptance and weight-bias reduction.

**State downward physical appearance comparison.** A final limitation for Study 2 pertains to the state downward physical appearance comparison measure. As discussed, the measure for downward physical appearance comparison was adjusted to capture state rather than trait differences. Though this was intended to capture the experimentally manipulated changes, it also raises the possibility that the participants' current appearance influenced their responses on the measure. Because the participants completed Study 2 online, it seems likely that the state of their appearance could have varied significantly. For example, participants could have been completing the study at home with leisurely appearance, or on campus after spending time on their appearance. Future research could attempt to gather this data by asking participants about their current appearance prior to any experimental manipulation, and examining how this relates to state downward physical appearance comparison.

## **Conclusion**

Broadly, the purpose of this research was to contribute to the growing literature examining the clinical impact of fat stereotype endorsement on body image in women. A mediated moderation model explaining how endorsement of fat stereotypes and body surveillance interact to influence body dissatisfaction through downward physical appearance comparison was examined. By experimentally manipulating the extent to which participants endorse fat stereotypes, causal support for the proposed model also was examined. In Study 1, body surveillance significantly moderated the relationship between fat stereotypes and body dissatisfaction in Caucasian normal weight women. Greater endorsement of fat stereotypes predicted greater body dissatisfaction in women with lower body surveillance. In women with higher body surveillance, fat stereotypes were not significantly related to body dissatisfaction. Further, downward physical appearance comparison was not found to be a significant mediator for this moderated effect. In Study 2, a significant interaction between body surveillance and study condition was observed. Specifically, women with lower body surveillance reported higher body dissatisfaction when presented with information that challenged fat stereotypes compared to information that supported fat stereotypes, the reverse of what was expected based on the results of Study 1. In contrast, women with higher body surveillance did not differ in their reports of body dissatisfaction depending on the type of information presented. Consistent with Study 1, this interaction was observed in Caucasian normal weight women only. Again, downward physical appearance comparison did not mediate this moderated effect, nor did the interaction significantly predict contrast versus assimilation effects.

Clearly, it is unfortunate that negative beliefs about a denigrated group might

improve body dissatisfaction in some cases. As described above, this degradation of overweight and obese individuals leads to a wide variety of discriminatory actions against this target group. The current findings suggest that weight bias is part of a complex system that can impact body image in nuanced ways. Further research is needed to identify methods that both reduce weight-stigma and also improve body satisfaction in more consistent and interpersonally acceptable ways.

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## APPENDICES

## Appendix A

## OBESE PERSONS TRAIT SURVEY (OPTS)

For each of the following traits, estimate the percentage (any number between 0 and 100) of Obese People whom you think possess this particular trait. Afterward, please indicate how confident you are in your estimate by circling a number. There are no right or wrong answers. Please give your best estimate.

1. Humorous: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

2. Lazy: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

3. Self-indulgent: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

4. Generous: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

5. Sociable: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

6. Undisciplined: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

7. Friendly: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

8. Gluttonous: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

9. Outgoing: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

10. Intelligent: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

11. Unhealthy: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

12. Honest: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

13. Sluggish: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

14. Productive: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

15. Lack of Willpower: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

16. Unclean: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

17. Warm: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

18. Insecure: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

19. Organized: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

20. Unattractive: \_\_\_\_\_ % of obese people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

For each of the following traits, estimate the percentage (any number between 0 and 100) of Average-Weight People whom you think possess this particular trait. Afterward, please indicate how confident you are in your estimate by circling a number. There are no right or wrong answers. Please give your best estimate.

1. Humorous: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

2. Lazy: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

3. Self-indulgent: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

4. Generous: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

5. Sociable: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

6. Undisciplined: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

7. Friendly: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

8. Gluttonous: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

9. Outgoing: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

10. Intelligent: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

11. Unhealthy: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

12. Honest: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

13. Sluggish: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

14. Productive: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

15. Lack of Willpower: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

16. Unclean: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

17. Warm: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

18. Insecure: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

19. Organized: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

20. Unattractive: \_\_\_\_\_ % of average-weight people possess this trait.

My confidence in the above estimate:

Not at all confident	1	2	3	4	5	6	7	8	9	Extremely Confident
-------------------------	---	---	---	---	---	---	---	---	---	------------------------

## Appendix B

OBJECTIFIED BODY CONSCIOUSNESS SCALE  
BODY-SURVEILLANCE SUBSCALE

1. I rarely think about how I look. (R)

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

2. I think it is more important that my clothes are comfortable than whether they look good on me. (R)

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

3. I think more about how my body feels than how my body looks. (R)

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

4. I rarely compare how I look with how other people look. (R)

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

5. During the day, I think about how I look many times.

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

6. I often worry about whether the clothes I am wearing make me look good.

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree



7. I rarely worry about how I look to other people. (R)

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

8. I am more concerned with what my body can do than how it looks. (R)

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

## Appendix C

## UPWARD AND DOWNWARD PHYSICAL APPEARANCE COMPARISON SCALE

To what extent do you agree with the following:

	Strongly Disagree				Strongly Agree
1. I compare myself to those who are better looking than me rather than those who are not.	1	2	3	4	5
2. When I see a person who is physically unattractive I think about how my body compares to theirs.	1	2	3	4	5
3. I tend to compare my own physical attractiveness to that of magazine models.	1	2	3	4	5
4. I tend to compare my body to those who have below average bodies.	1	2	3	4	5
5. I find myself thinking about whether my own appearance compares well with models and movie stars.	1	2	3	4	5
6. At the beach, gym, or sporting events, I compare my body to those with less athletic bodies.	1	2	3	4	5
7. At the beach or athletic events (sports, gym, etc.) I wonder if my body is as attractive as the people I see there with very attractive bodies.	1	2	3	4	5
8. I compare myself to people less good looking than me.	1	2	3	4	5
9. I tend to compare myself to people I think look	1	2	3	4	5

better than me.

10. I think about how attractive my body is compared to overweight people	1	2	3	4	5
11. When I see a person with a great body, I tend to wonder how I “match up” with them.	1	2	3	4	5
12. At parties, I often compare my looks to the looks of unattractive people.	1	2	3	4	5
13. When I see good-looking people, I wonder how I compare to them.	1	2	3	4	5
14. I find myself comparing my appearance with people who are better looking than me.	1	2	3	4	5
15. I often compare myself to those who are less physically attractive.	1	2	3	4	5
16. At parties or other social events, I compare my physical appearance to the physical appearance of the very attractive people.	1	2	3	4	5
17. I compare my body to people who have a better body than me.	1	2	3	4	5
18. I tend to compare my physical appearance with people whose bodies are not as physically appealing.	1	2	3	4	5

## Appendix D

## EATING DISORDER INVENTORY – 2 – BODY DISSATISFACTION SUBSCALE

The items below ask about your attitudes, feelings, and behaviour. Some of the items relate to food or eating. Other items ask about your feelings about yourself.

For each item, decide if the item is true about you ALWAYS (A), USUALLY (U), OFTEN (O), SOMETIMES (S), RARELY (R), or NEVER (N). Choose the letter that corresponds to your rating. For example, if your rating for an item is OFTEN, you would choose O for that item.

Respond to all of the items, making sure that you circle the letter for the rating that is true about you.

	Always (A)	Usually (U)	Often (O)	Sometimes (S)	Rarely (R)	Never (N)
2. I think that my stomach is too big	A	U	O	S	R	N
9. I think that my thighs are too large	A	U	O	S	R	N
12. I think that my stomach is just the right size	A	U	O	S	R	N
19. I feel satisfied with the shape of my body	A	U	O	S	R	N
31. I like the shape of my buttocks	A	U	O	S	R	N
45. I think my hips are too big	A	U	O	S	R	N
55. I think that my thighs are just the right size	A	U	O	S	R	N
59. I think my buttocks are too large	A	U	O	S	R	N
62. I think that my hips are just the right size	A	U	O	S	R	N

## Appendix E

## SOCIOCULTURAL ATTITUDES TOWARDS APPEARANCE SCALE – 3

Items 3, 4, 7, 8, 11, 12, 15, 16, and 27 compose the Internalization General subscale.

Please read each of the following items carefully and indicate the number that best reflects your agreement with the statement.

Definitely Disagree = 1

Mostly Disagree = 2

Neither Agree Nor Disagree = 3

Mostly Agree = 4

Definitely Agree = 5

1. TV programs are an important source of information about fashion and "being attractive."
2. I've felt pressure from TV or magazines to lose weight.
3. I do not care if my body looks like the body of people who are on TV. (R)
4. I compare my body to the bodies of people who are on TV.
5. TV commercials are an important source of information about fashion and "being attractive."
6. I do not feel pressure from TV or magazines to look pretty. (R)
7. I would like my body to look like the models who appear in magazines.
8. I compare my appearance to the appearance of TV and movie stars.
9. Music videos on TV are not an important source of information about fashion and "being attractive." (R)
10. I've felt pressure from TV and magazines to be thin.
11. I would like my body to look like the people who are in movies.
12. I do not compare my body to the bodies of people who appear in magazines. (R)
13. Magazine articles are not an important source of information about fashion and "being attractive." (R)
14. I've felt pressure from TV or magazines to have a perfect body.
15. I wish I looked like the models in music videos.
16. I compare my appearance to the appearance of people in magazines.
17. Magazine advertisements are an important source of information about fashion and "being attractive."
18. I've felt pressure from TV or magazines to diet.
19. I do not wish to look as athletic as the people in magazines. (R)
20. I compare my body to that of people in "good shape."
21. Pictures in magazines are an important source of information about fashion and "being attractive."
22. I've felt pressure from TV or magazines to exercise.
23. I wish I looked as athletic as sports stars.
24. I compare my body to that of people who are athletic.
25. Movies are an important source of information about fashion and "being attractive."
26. I've felt pressure from TV or magazines to change my appearance.

- 27. I do not try to look like the people on TV. (R)
- 28. Movie stars are not an important source of information about fashion and "being attractive." (R)
- 29. Famous people are an important source of information about fashion and "being attractive."
- 30. I try to look like sports athletes.

## Appendix F

## BECK DEPRESSION INVENTORY – II

This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

<p><b>1. Sadness</b></p> <p>0 I do not feel sad.</p> <p>1 I feel sad much of the time.</p> <p>2 I am sad all the time.</p> <p>3 I am so sad or unhappy that I can't stand it.</p> <p><b>2. Pessimism</b></p> <p>0 I am not discouraged about my future.</p> <p>1 I feel more discouraged about my future than I used to be.</p> <p>2 I do not expect things to work out for me.</p> <p>3 I feel my future is hopeless and will only get worse.</p> <p><b>3. Past Failure</b></p> <p>0 I do not feel like a failure.</p> <p>1 I have failed more than I should have.</p> <p>2 As I look back, I see a lot of failures.</p> <p>3 I feel I am a total failure as a person.</p> <p><b>4. Loss of Pleasure</b></p> <p>0 I get as much pleasure as I ever did from the things I enjoy.</p> <p>1 I don't enjoy things as much as I used to.</p> <p>2 I get very little pleasure from the things I used to enjoy.</p> <p>3 I can't get any pleasure from the things I used to enjoy.</p> <p><b>5. Guilty Feelings</b></p> <p>0 I don't feel particularly guilty.</p> <p>1 I feel guilty over many things I have done or should have done.</p> <p>2 I feel quite guilty most of the time.</p> <p>3 I feel guilty all of the time.</p>	<p><b>6. Punishment Feelings</b></p> <p>0 I don't feel I am being punished.</p> <p>1 I feel I may be punished.</p> <p>2 I expect to be punished.</p> <p>3 I feel I am being punished.</p> <p><b>7. Self-Dislike</b></p> <p>0 I feel the same about myself as ever.</p> <p>1 I have lost confidence in myself.</p> <p>2 I am disappointed in myself.</p> <p>3 I dislike myself.</p> <p><b>8. Self-Criticalness</b></p> <p>0 I don't criticize or blame myself more than usual.</p> <p>1 I am more critical of myself than I used to be.</p> <p>2 I criticize myself for all my faults.</p> <p>3 I blame myself for everything bad that happens.</p> <p><b>9. Suicidal Thought or Wishes</b></p> <p>0 I don't have any thoughts of killing myself.</p> <p>1 I have thoughts of killing myself, but I would not carry them out.</p> <p>2 I would like to kill myself.</p> <p>3 I would kill myself if I had the chance.</p> <p><b>10. Crying</b></p> <p>0 I don't cry anymore than I used to.</p> <p>1 I cry more than I used to.</p> <p>2 I cry over every little thing.</p> <p>3 I feel like crying, but I can't.</p>
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<p><b>11. Agitation</b></p> <p>0 I am no more restless or wound up than usual.</p> <p>1 I feel more restless or wound up than usual.</p> <p>2 I am so restless or agitated that it's hard to stay still.</p> <p>3 I am so restless or agitated that I have to keep moving or doing something.</p> <p><b>12. Loss of Interest</b></p> <p>0 I have not lost interest in other people or activities.</p> <p>1 I am less interested in other people or things than before.</p> <p>2 I have lost most of my interest in other people or things.</p> <p>3 It's hard to get interested in anything.</p> <p><b>13. Indecisiveness</b></p> <p>0 I make decisions about as well as ever.</p> <p>1 I find it more difficult to make decisions than usual.</p> <p>2 I have much greater difficulty in making decisions than I used to.</p> <p>3 I have trouble making any decisions.</p> <p><b>14. Worthlessness</b></p> <p>0 I do not feel I am worthless.</p> <p>1 I don't consider myself as worthwhile and useful as I used to.</p> <p>2 I feel more worthless as compares to other people.</p> <p>3 I feel utterly worthless.</p> <p><b>15. Loss of Energy</b></p> <p>0 I have as much energy as ever.</p> <p>1 I have less energy than I used to have.</p> <p>2 I don't have enough energy to do very much.</p> <p>3 I don't have enough energy to do anything.</p> <p><b>16. Changes in Sleeping Pattern</b></p> <p>0 I have not experienced any change in my sleeping pattern.</p> <p>1a I sleep somewhat more than usual.</p> <p>1b I sleep somewhat less than usual.</p> <p>2a I sleep a lot more than usual.</p> <p>2b I sleep a lot less than usual.</p> <p>3a I sleep most of the day.</p> <p>3b I wake up 1-2 hours early and can't get back to sleep.</p>	<p><b>17. Irritability</b></p> <p>0 I am no more irritable than usual.</p> <p>1 I am more irritable than usual.</p> <p>2 I am much more irritable than usual.</p> <p>3 I am irritable all the time.</p> <p><b>18. Changes in Appetite</b></p> <p>0 I have not experienced any change in my appetite.</p> <p>1a My appetite is somewhat less than usual.</p> <p>1b My appetite is somewhat greater than usual.</p> <p>2a My appetite is much less than before.</p> <p>2b My appetite is much greater than usual.</p> <p>3a I have no appetite at all.</p> <p>3b I crave food all the time.</p> <p><b>19. Concentration Difficulty</b></p> <p>0 I can concentrate as well as ever.</p> <p>1 I can't concentrate as well as usual.</p> <p>2 It's hard to keep my mind on anything for very long.</p> <p>3 I find I can't concentrate on anything.</p> <p><b>20. Tiredness or Fatigue</b></p> <p>0 I am no more tired or fatigued than usual.</p> <p>1 I get more tired or fatigued more easily than usual.</p> <p>2 I am too tired or fatigued to do a lot of the things I used to do.</p> <p>3 I am too tired or fatigued to do most of the things I used to do.</p> <p><b>21. Loss of Interest in Sex</b></p> <p>0 I have not noticed any recent change in my interest in sex.</p> <p>1 I am less interested in sex than I used to be.</p> <p>2 I am much less interested in sex now.</p> <p>3 I have lost interest in sex completely.</p>
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## Appendix G

## MARLOWE-CROWNE SOCIAL DESIRABILITY SCALE – FORM C

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *true or false* as it pertains to you personally.

1. It is sometimes hard for me to go on with my work if I am not encouraged.  
\_\_\_\_\_
2. I sometimes feel resentful when I don't get my way. \_\_\_\_\_
3. On a few occasions, I have given up doing something because I thought too little of my ability. \_\_\_\_\_
4. There have been times when I felt like rebelling against people in authority even though I knew they were right. \_\_\_\_\_
5. No matter who I'm talking to, I'm always a good listener. \_\_\_\_\_
6. There have been occasions when I took advantage of someone. \_\_\_\_\_
7. I'm always willing to admit when I make a mistake. \_\_\_\_\_
8. I sometimes try to get even rather than forgive and forget. \_\_\_\_\_
9. I am always courteous, even to people who are disagreeable. \_\_\_\_\_
10. I have never been irked when people expressed ideas very different from my own. \_\_\_\_\_
11. There have been times when I was quite jealous of the good fortune of others.  
\_\_\_\_\_
12. I am sometimes irritated by people who ask favors of me. \_\_\_\_\_
13. I have never deliberately said something that hurt someone's feelings. \_\_\_\_\_

## Appendix H

## ROSENBERG SELF-ESTEEM SCALE

Please record the appropriate answer per item, depending on whether you strongly agree, agree, disagree, or strongly disagree with it.

3	2	1	0
strongly agree	agree	disagree	strongly disagree

- \_\_\_\_\_ 1. I feel that I am a person of worth, at least on an equal plane with others.
- \_\_\_\_\_ 2. I feel that I have a number of good qualities.
- \_\_\_\_\_ 3. All in all, I am inclined to feel that I am a failure.
- \_\_\_\_\_ 4. I am able to do things as well as most people.
- \_\_\_\_\_ 5. I feel that I do not have much to be proud of.
- \_\_\_\_\_ 6. I take a positive attitude toward myself.
- \_\_\_\_\_ 7. On the whole, I am satisfied with myself.
- \_\_\_\_\_ 8. I wish I could have more respect for myself.
- \_\_\_\_\_ 9. I certainly feel useless at times.
- \_\_\_\_\_ 10. At times I think that I am no good at all.

Appendix I  
DEMOGRAPHIC QUESTIONNAIRE

Age: \_\_\_\_\_ Gender: \_\_\_\_\_

**What is your racial/ethnic background?**

Aboriginal	<input type="checkbox"/>	South Asian	<input type="checkbox"/>	Arab or West Asian	<input type="checkbox"/>
African	<input type="checkbox"/>	European	<input type="checkbox"/>	Caribbean	<input type="checkbox"/>
East Asian	<input type="checkbox"/>	Caucasian	<input type="checkbox"/>	South American	<input type="checkbox"/>
Other (please specify): _____					

**What is your weight classification?**

Underweight	<input type="checkbox"/>	Overweight	<input type="checkbox"/>
Normal Weight	<input type="checkbox"/>	Obese	<input type="checkbox"/>

**Have you ever been diagnosed with an eating disorder?**

Yes ☐ No ☐

**What is your current weight (select if in lbs or in kg)?** \_\_\_\_\_

**What is your current height (select if in feet and inches or in metres)?** \_\_\_\_\_

**School enrolment:** Full time student ☐ Part time student ☐

**Years in University:**

First year	<input type="checkbox"/>	Third year	<input type="checkbox"/>	More than 4 years	<input type="checkbox"/>
Second year	<input type="checkbox"/>	Fourth year	<input type="checkbox"/>		

Including your current psychology course, how many psychology courses have you taken so far? \_\_\_\_\_

**Academic focus:**

What is/are your major(s)? \_\_\_\_\_

What is/are your minor(s)? \_\_\_\_\_

**Current employment status:**

Unemployed ☐  
Full time ☐  
Part time ☐

**If you are currently employed, what is your occupation?**

Clerical	<input type="checkbox"/>	Labourer	<input type="checkbox"/>
Professional	<input type="checkbox"/>	Self-employed	<input type="checkbox"/>
Owner/manager	<input type="checkbox"/>	Other:	_____

## Appendix J

## PARTICIPANT POOL RECRUITMENT ADVERTISEMENT – Study 1

Title: Perceiving People and Individual Differences

Researchers: Jean Kim

Duration: 30 minutes

Credits: 0.5 credit

Description:

The purpose of the study is to examine individual differences and perceptions of people in undergraduate students. The study is completed online and in one session. You will be asked to complete a series of questionnaires related to individual differences and perceptions of people. All responses will remain confidential. Once you sign up for the study, the researcher will email you the URL to the study webpage. It may take up to 24 hours to receive this email.

The study will take no more than 30 minutes of your time, and is worth 0.5 bonus point if you are registered in the pool and you are registered in one or more eligible psychology courses.

## Appendix K

**LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: **Perceiving People and Individual Differences**

You are asked to participate in a research study conducted by Jean Kim and supervised by Dr. Josée Jarry from the Department of Psychology at the University of Windsor. The study results will be used to fulfil the requirements of a Doctoral dissertation.

If you have any questions or concerns about the research, please feel to contact Jean Kim at kim11f@uwindsor.ca, or Dr. Josée Jarry at 519-253-3000 ext. 2237.

**PURPOSE OF THE STUDY**

The purpose of this study is to explore the relationships between individual differences in various psychological factors and perceptions of people in undergraduate students.

**PROCEDURES**

If you volunteer to participate in this study, you will be asked to do the following things. You will be asked to complete several online questionnaires about individual differences and perceptions of people. At the end of the study, you will be directed to a separate form that will ask you to provide your name and student number to verify your bonus credit for participation.

The entire study will take approximately 30 minutes of your time. The study must be completed in one online session. If you volunteer to participate, please set aside one uninterrupted half hour and complete the study in a quiet area without distractions.

**POTENTIAL RISKS AND DISCOMFORTS**

You will be asked some questions that are personal in nature. A risk of this study is the possibility that thinking about these personal issues may cause some psychological or emotional discomfort. If you have any concerns you wish to discuss, please feel free to contact the principal investigator, Jean Kim, the faculty advisor, Dr. Josée Jarry, or the Student Counselling Centre at 519-253-3000 ext. 4616.

**POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY**

Participating in this study will provide you with an opportunity to learn about psychological research. Specifically, you will gain knowledge in conducting psychological research online. Also, you may learn more about yourself and your perceptions of people. Finally, participating in this research will contribute to scientific knowledge about psychological factors and person perception in undergraduate students.

**COMPENSATION FOR PARTICIPATION**

You will receive 0.5 bonus point towards a psychology course for 30 minutes of participation, provided you are registered in the psychology participant pool and enrolled in one or more eligible courses.

**CONFIDENTIALITY**

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. At the end of the study, we must collect your

name and student number for you to receive your bonus credit. However, your data will be kept separate from any identifying information. All files will be encrypted and password-protected, and will be stored in the University of Windsor data servers. Your data will be retained for 10 years, after which it will be securely deleted from the servers.

## PARTICIPATION AND WITHDRAWAL

Your participation in this study is completely voluntary. If you decide to participate, you may withdraw at any time during the study by clicking on the "Discard responses and exit" button without negative consequences of any kind. However, if you choose to withdraw before completing the survey, you will not receive the bonus credit. You may refuse to answer any questions you do not want to answer by leaving the question blank, and still remain in the study. We encourage you to answer all questions with which you are comfortable answering, as your responses are important to our investigation. After completing the session, you will have the option of removing your data from the study. You will be awarded the bonus credit if you complete the survey, regardless of whether you choose to include or remove your data from the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

## FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

Once the research is complete, results will be available to all participants on the University of Windsor REB website.

Web address: [www.uwindsor.ca/reb](http://www.uwindsor.ca/reb)

Date when results are available: October 2016

## SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications, and in presentations. If so, any identifying information will be confidential, and only group data will be reported.

## RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

## SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Jean Kim, M.A.

Department of Psychology

University of Windsor

**It is recommended that you print out a copy of this letter of information for your records. It also is recommended that you turn off your pop-up blockers before beginning the survey, should you choose to do so.**

## CONSENT OF RESEARCH PARTICIPANT

"I understand the information provided for the study 'Perceiving People and Individual Differences' described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I will print a copy of this form for my own reference."

To acknowledge that you have read the letter of information, and that you are providing informed consent to participate in this study, please click "I agree" below.

I agree

No thank you

## Appendix L

## POST-STUDY INFORMATION DEBRIEFING FORM

Thank you for participating in this study. Your time and willingness to participate are greatly appreciated.

After reading the following post-study information, please go to \*URL\* to receive your bonus credit.

Fat stereotypes are negative beliefs associated with excess weight. Common fat stereotypes include the beliefs that overweight and obese people are lazy, self-indulgent, and lack willpower. Past research has shown that believing fat stereotypes is associated with negative mental health outcomes. This research has focused on the relationship between holding fat stereotypes and mental health in overweight and obese women. In this study, we are exploring whether or not these stereotypical beliefs are related to body image in normal weight women. For example, does believing that most overweight and obese people are lazy relate to body dissatisfaction in women who are of normal weight? If so, does this relationship differ for normal weight versus overweight women?

Past research also has demonstrated that the tendency to closely examine and look at one's body is harmful to body satisfaction. A second interest in this study is to follow up on previous research that suggests that women who have this tendency, and who also hold fat stereotypes, experience less body dissatisfaction than do women who examine their body and do not hold fat stereotypes. Finally, the study examined whether the tendency to compare oneself to people perceived to be less physically attractive explains why holding fat stereotypes, combined with the frequent examination one's body, impacts body satisfaction. It is expected that comparing oneself to people perceived to be less physically attractive improves one's body satisfaction.

For further information on these topics, please consult the following references:

Frederick, D. A., Forbes, G. B., Grigorian, K. E., & Jarcho, J. M. (2007). The UCLA body project I: Gender and ethnic differences in self-objectification and body satisfaction among 2,206 undergraduates. *Sex Roles: A Journal of Research*, 57(5-6), 317-327. doi:10.1007/s11199-007-9251-z

Friedman, K. E., Reichmann, S. K., Costanzo, P. R., Zelli, A., Ashmore, J. A., & Musante, G. J. (2005). Weight stigmatization and ideological beliefs: Relation to psychological functioning in obese adults. *Obesity Research*, 13(5), 907-916. doi:10.1038/oby.2005.105

Puhl, R., & Brownell, K. D.. (2001). Bias, discrimination, and obesity. *Obesity Research*, 9(12), 788-805.

If you have any concerns about the study, or if you are interested in additional information, please feel free to contact the primary investigator, Jean Kim, at [kim11f@uwindsor.ca](mailto:kim11f@uwindsor.ca). **Please print this page for your reference.**

If you wish to talk about any personal issues that came to your attention today, please contact the Student Counselling Centre at 519-253-3000 ext. 4616.

Additional Community Resources:

Bulimia Anorexia Nervosa Association

Telephone: 519-969-2112

Email: [info@bana.ca](mailto:info@bana.ca)

Website: [www.bana.ca](http://www.bana.ca)

Community Crisis Centre of Windsor

Telephone: 519-973-4435

Website: <http://windsoressessex.cioc.ca/record/WIN0762>

Distress Centre – Windsor-Essex County

Telephone: 519-256-5000

Website: [www.dcwindsor.com](http://www.dcwindsor.com)



## Appendix M

### Fat Stereotype Support Condition – Controllable Causes of Obesity (word count: 1398)

Since the late 20<sup>th</sup> century, obesity has been described as a public health crisis, an epidemic, and the world's leading food and nutrition problem (Rudd Center for Food Policy and Obesity, 2013). Based on Body Mass Index (BMI), over one half of Canadian adults are overweight or obese, according to measured height and weight data collected from 2007 to 2009. Obesity is primarily considered a physical ailment with a vast array of associated morbidities, such as Type 2 diabetes, chronic back pain, and cardiovascular diseases. Obesity, however, also is connected to prevailing social beliefs about traits of individuals who carry excess fat. Referred to as fat stereotypes, these include beliefs that excess weight is a matter of self-control and poor willpower. But, how true are these stereotypes? Though research has shown that determinants of obesity are incredibly varied and extend beyond such traits, other factors are indeed related to personal agency. Although not every person is equal in their natural tendency toward gaining weight, several behaviours and choices are very much controllable by the individual. These factors occurring within personal awareness and control will be summarized in the remainder of this report.

#### **Engaging in Physical Activity as Obesity Prevention**

There is considerable evidence supporting an inverse relationship between obesity and physical activity. In other words, the less one engages in physical activity, the more likely they are to gain excess weight. Along these lines, an epidemic of a lack of cardio-respiratory fitness is considered to be a significant contributor to the obesity epidemic in Canada (Public Health Agency of Canada, 2011). Several studies indicate that aerobic exercise results in weight loss when compared to sedentary lifestyles, even without considering food intake (Garrow & Summerbell, 1995). Similarly, several researchers have found that regular light aerobic exercise without restricting food intake leads to substantial reductions in both fat and weight, as well as improved cardiorespiratory fitness (Ross et al., 2012). This means that weight loss is achievable through engagement in physical activity, even without considering food consumption. Unfortunately, only about half of Canadians aged 12 and over are considered to be active or moderately active (Public Health Agency of Canada, 2011). Combined with the sobering statistics on obesity rates in Canada, this raises concern about personal responsibility in maintaining one's weight. It seems that many people fail to place physical activity as an important priority in weight and health maintenance.

#### **Influence of Sedentary Behaviours in Excess Weight**

On the other side of the physical activity coin is sedentary lifestyle. Sedentary behaviours are tasks that involve little to no physical movement, including time spent reading, sitting during transit, and in front a screen, such as televisions, videos, or computers. Overall, research has found that greater engagement in sedentary behaviours is a leading contributor to obesity. Given the ever-increasing dependence on computers, it is notable that high level of screen time has been linked to a greater likelihood of obesity (Ebbeling, Pawlak, & Ludwig, 2002). One study found that while overweight and non-overweight adolescents do not differ in time spent engaging in physical activity, they do differ by

screen time (Canadian Population Health Initiative, 2009). Specifically, overweight adolescents spend more in front of a screen than do non-overweight adolescents (Canadian Population Health Initiative, 2009). Further, greater dependency on transit that involves sitting or passive standing, such as driving a car or using an elevator, rather than use of more active transportation methods, such as walking, bicycling, or taking stairs, leads to excess weight (Public Health Agency of Canada, 2011). With more and more people choosing sedentary lifestyles with limited physical activity, it is no wonder that obesity rates are climbing.

### **Healthier Food Choices Equals Healthier Weight**

In addition to physical inactivity and sedentary behaviours, diet is the most studied behavioural factor contributing to the risk of excess body weight. Overall, the research finds that poor eating patterns are a key determinant of obesity. Several studies have found that low consumption of fruits and vegetables is linked to greater likelihood of obesity. Further, research examining energy intake in Canada from 1976 to 2003 has shown a strong relationship between rising rates of obesity and rising energy consumption (Public Health Agency of Canada, 2011). This simplifies to eating more equals weighing more. Though total calories consumed from fat have decreased over this time period, this has been accompanied by a compensatory increase in carbohydrate consumption. This increase in sugar consumption is composed mostly of heavily refined foods, such as breads, ready-to-eat- cereals, soft drinks, cakes, and cookies. Dietary choices that are dominated by the consumption of these refined foods also induce a sequence of hormonal events that stimulates hunger (Hill, 2006). This means that selecting these sugary foods that are calorie-dense also leads to overeating. This, in turn, is linked with greater fat development and weight gain. One particularly problematic dietary choice in current day is fast food. The rise of fast food consumption has steadily matched the rise of obesity rates over the past several decades. Eating outside the home, particularly at fast food restaurants, is associated with overeating, greater levels body fat, and poorer diet quality (Hill, 2006). Clearly, food choices leading to lower consumption of nutrition-rich foods such as fruit, vegetables and whole grains, in combination with greater consumption of refined sugars and calorie-dense foods, has contributed to increases in obesity rates.

### **Creating Unhealthy Food Environments**

How we create our food environments also influences our dietary choices, behaviours, and consequently, our weight. In particular, eating regular meals with one's family has significantly reduced in recent decades (Ebell, 2002). Unfortunately, this has been replaced with unhealthy food choices. For example, a poor food environment involves snacking or eating dinner while on the computer or watching television, grabbing quick meals "on-the-go" to eat while in transit, and skipping meals because of lack of appropriate time management. All of these decisions lead to unnecessary overeating and greater total energy intake. Making conscious choices to sit down and eat well-balanced and well-proportioned meals seem to have all but disappeared in our rushed lives.

### **Overeating: A Main Culprit of Obesity**

In addition to the importance of dietary selection, decisions around how much one eats influence the development of excess weight. Portion sizes have increased drastically since the early to mid-20<sup>th</sup> century. The increase in the prevalence of obesity has coincided with this increase in portion size, both inside and outside the home (Ello-Martin et al., 2005). The trend of “Super Sizing” fast food meals and cups has been adopted by the dominating corporations of McDonalds and Starbucks. This “Super Sizing” trend is problematic because people fail to compensate for the larger portion sizes. Instead, people who select larger food portions consume more food without increasing their energy expenditure. Interestingly, people do not report increased levels of fullness when they consume larger portions (Rolls et al., 1999). This means that when we select larger portion sizes, our hunger and fullness signals are either ignored or overridden. This becomes problematic for the development of obesity when overeating is combined with poor dietary choices. Eating a large volume of energy-dense foods leads to excess weight, while eating the same amount of low-energy-dense foods, such as fruits and vegetables, maintains feelings of fullness without the associated increase in weight. Further studies have shown that consuming larger portions becomes habit. Consuming more energy on one day leads to similar increases in consumption the day after (Rolls et al., 2005). The adage of “we are what we repeatedly do” seems relevant to this research, in that poor habits of overeating reinforce themselves, eventually leading to excess weight. Combining the increase of portion size, the increased consumption of sugars, and the decrease in physical activity, it becomes clear that people face a number of daily decisions that directly contribute to their health and weight. Sound dietary choices in combination with appropriate portion size and consumption becomes important in the control of body weight.

In summary, this brief report has reviewed several behavioural and lifestyle choices that have contributed to the obesity epidemic that began in the 1980s. Evidently, these choices appear to be within the realm of personal responsibility. Indeed, prevention of obesity ultimately involves eating less calorie-dense foods, more nutrition-rich foods, proper portion sizes, and appropriate engagement in physical activity. This indicates that the prevention of obesity is largely a matter of knowledgeable and healthful choices and behaviours made by the individual.

## Appendix N

Fat Stereotype Challenge Condition – Uncontrollable Causes of Obesity (word count: 1397)

Since the late 20<sup>th</sup> century, obesity has been described as a public health crisis, an epidemic, and the world's leading food and nutrition problem (Rudd Center for Food Policy and Obesity, 2013). Based on Body Mass Index (BMI), over one half of Canadian adults are overweight or obese, according to measured height and weight data collected from 2007 to 2009. Obesity is primarily considered a physical ailment with a vast array of associated morbidities, such as Type 2 diabetes, chronic back pain, and cardiovascular diseases. Obesity, however, also is connected to prevailing social beliefs about traits of individuals who carry excess fat. Referred to as fat stereotypes, these include beliefs that excess weight is a matter of self-control and poor willpower. But, how true are these stereotypes? Research has shown that determinants of obesity are incredibly varied and extend beyond simple traits. In fact, many of these determinants are not controllable, and experts in obesity propose a strong argument that “food consumption occurs in ways that defy personal insight or are below individual awareness” (Cohen, 2008). Though popular belief is that overweight and obesity are controllable through willpower, their determinants are far more complex. Many aspects of weight are connected with uncontrollable factors, such as genetics, indicating that social beliefs regarding fat stereotypes are misplaced. These uncontrollable factors often occur outside of personal awareness and will be summarized in the remainder of this report.

**Genetics: At Least Half the Culprit of Obesity**

Readers are often interested in the genetics of obesity. How much of weight is predetermined by your genetics? In fact, research has consistently indicated that 50-70% of BMI is attributable to genetics. This is only slightly less than the documented heritability of height, which ranges from 60-80%. Twin studies, for example, look at the relative importance of genetic and environmental effects on the BMI of twins raised apart compared to twins raised together. These studies consistently conclude that some individuals are genetically more susceptible to gaining weight and body fat (Rosin, 2008). Even further, some individuals are also genetically more resistant to weight loss (Rosin, 2008).

**Evidence for A “Fat” Gene**

Though heritability estimates give good indication of the genetic contribution to obesity, it is even more convincing that researchers have found evidence for a “fat” gene. Specifically, evidence for a gene that encodes a ‘fat mass and obesity-associated protein’, also known as the FTO gene, has been well-documented. A large population study found that a specific configuration of this gene is associated with a nearly 2-fold higher rate of obesity (Frayling et al., 2007). A separate study found that this same FTO gene explains a significant percentage of the attributable risk to obesity in the population (Dina et al., 2007). In 2009, two large population-based genome studies further confirmed that variants of the FTO gene are associated with obesity (Willer et al., 2009). This adds more specific confirmation that genetics play a major role in the development of excess weight.

Because of the rapid development of obesity in genetically stable populations, however, genetics alone cannot explain increases in obesity rates in recent decades. Additional uncontrollable factors, combined with genetic susceptibility, contribute to increased body weight in the population.

### **An Evolutionary Push to Eat**

Interestingly, researchers believe that overeating has a biological basis, arising from survival instincts. The “thrifty gene” hypothesis states that scarce availability of food throughout human evolution has led some population groups to be especially prone to obesity, particularly those who have inconsistent accessibility to food (Neel, 1998). For these groups, storing energy as fat is advantageous during periods of unpredictable food availability, ensuring survival in these times. This natural tendency to store fat, however, leads to excessive storage during times of high food availability. Considering the abundance and availability of food in Canada today, it is little wonder why overeating and consequent obesity is so prevalent in current day.

### **Biology’s Role in Our Food Choices**

Not only does evolution influence the amount we eat, but it also has conditioned the food choices that we make. People choose foods not just for flavor or by habit, but also by caloric density measured by feelings of fullness after eating (Smith, 2004). This means that we are biologically pulled toward foods that are rich in calories, which provide us with the satisfying feeling of being full. Further, Smith and Tasnadi (2003) propose a theory of natural addiction in which consumption of sweetened foods causes immediate release of endorphins in the brain. Sweetened foods thus act as a natural painkiller, making us feel better without consciously knowing it. A clear example of this natural addiction to sweetened foods is seen in infants, born with a predisposition to prefer sweetened foods over bitter or sour foods, which tend to be less calorie-dense (Birch, 1999). There is also a ‘belief’ in our genes that foods containing sugar are nearly always nutritionally valuable. Though this is untrue in today’s food environment of refined sugar, the biochemical system on which we rely when choosing foods has not changed – we still react to sweet foods as we did in prehistoric times of survival. Because eating preferences are genetically fixed and do not adapt to rapid changes in modern environments, overeating is considered a natural manifestation of a fundamental mismatch between ancient and modern food environments.

Uncontrollable genetic and biological factors contributing to obesity are important to acknowledge, but they represent only part of the explanation for the rise in obesity over the past several decades. Understanding factors of an obesogenic environment, one that promotes weight gain through advertisement of unhealthy food choices and encouragement of less physical activity, is also important when considering uncontrollable causes of obesity.

### **The Role of Schools in Eating**

Schools have a primary role in food consumption for children and adolescents. In the United States, approximately 75% of school-aged children eat lunch at school, and consume 1/3 of their total calories from this one meal. Schools tend to adopt unhealthy

food policies, providing lunches that do not meet nutritional guidelines and that are calorie-dense, while not offering healthy alternative options. Anderson and Butcher (2006) found that adolescents with a genetic susceptibility to obesity are most affected by the school food environment, indicating a combination of two uncontrollable factors that lead to increases in body fat. Consider also that eating habits built in childhood and adolescence are typically carried into adulthood and are extremely difficult to break.

### **The Powerful Influence of Food Policy and Marketing**

Increases in obesity rates are strongly correlated with changes in a global food system that is producing more processed, cheaper, and aggressively marketed food than ever before (Swinburn et al., 2011). A central tenet of modern market-based economies is economic growth, which promotes a consumer mentality and an emphasis on the consumption of goods, including food. The technological changes that are creating cheaper and more available food calories, along with the strong economic forces driving consumption, inevitably lead to overconsumption and obesity. The drive for economic growth is so strong that the rise in obesity rates is now described as a “sign of commercial success” (Rosin, 2008). This pressure for economic growth makes policymakers reluctant to reduce marketing of calorie-dense foods and beverages, often targeted to children, creating food environments that promote high-energy intake. The Institute of Medicine recently conducted a study investigating food marketing toward children (Nestle, 2006). They found that that food marketing intentionally targets children who are too young to distinguish advertising from truth, and entices them to eat high calorie, low-nutrient (but highly profitable!) “junk” foods. This marketing strategy successfully influences children’s food preferences, requests, and consumption. Considering the economic context of food and eating, researchers suggest that obesity is the result of people responding normally to the obesogenic environments in which they find themselves. From both a health and economic perspective, the priority should be for policymakers to reverse and control the excessive consumption-driven nature of food marketing, rather than placing the responsibility solely on individuals with obesity.

In summary, this brief report has reviewed several genetic and environmental factors that have contributed to the obesity epidemic that began in the 1980s. Evidently, these factors dispute common belief that excess weight is simply a matter of personal choice. Instead, excess weight is the result a complex interaction between genetic, biological, economic, and political factors, indicating obesity as a matter of responsibility far greater than any one individual.

## Appendix O

STATE UPWARD AND DOWNWARD PHYSICAL APPEARANCE COMPARISON  
SCALE

To what extent do you agree with the following items **RIGHT NOW AT THIS VERY MOMENT**.

	Strongly Disagree				Strongly Agree
1. Right now, I would compare myself to those who are better looking than me rather than those who are not.	1	2	3	4	5
2. If I were to see a person who is physically unattractive right now, I would think about how my body compares to theirs.	1	2	3	4	5
3. Right now, I would compare my own physical attractiveness to that of magazine models.	1	2	3	4	5
4. Right now, I would compare my body to those who have below average bodies.	1	2	3	4	5
5. Right now, I find myself thinking about whether my own appearance compares well with models and movie stars.	1	2	3	4	5
6. If I was at the beach, gym, or sporting events right now, I would compare my body to those with less athletic bodies.	1	2	3	4	5

7. If I were at the beach or at an athletic event (sports, gym, etc.) right now, I would wonder if my body is as attractive as the people I would see there with very attractive bodies.	1	2	3	4	5
8. Right now, I would compare myself to people less good looking than me.	1	2	3	4	5
9. Right now, I would compare myself to people I think look better than me.	1	2	3	4	5
10. Right now, I am thinking about how attractive my body is compared to overweight people	1	2	3	4	5
11. If I were to see a person with a great body right now, I would wonder how I “match up” with them.	1	2	3	4	5
12. If I were at a party right now, I would compare my looks to the looks of unattractive people.	1	2	3	4	5
13. If I were to see good-looking people right now, I would wonder how I compare to them.	1	2	3	4	5
14. Right now, I find myself comparing my appearance with people who are better looking than me.	1	2	3	4	5
15. Right now, I would compare myself to those who are less physically attractive.	1	2	3	4	5
16. If I were at a party or other social event, I would compare my physical appearance to the physical appearance of the very attractive people.	1	2	3	4	5
17. Right now, I would compare my body to people who have a better body than me.	1	2	3	4	5
18. Right now, I would compare my physical appearance with people whose bodies are not as physically appealing.	1	2	3	4	5



Appendix P  
BODY IMAGE STATE SCALE

For each of the items below, check the box beside the one statement that best describes how you feel **RIGHT NOW AT THIS VERY MOMENT**. Read the items carefully to be sure the statement you choose accurately and honestly describes how you feel right now.

1. Right now I feel...

- ☐ *Extremely dissatisfied* with my physical appearance
- ☐ *Mostly dissatisfied* with my physical appearance
- ☐ *Moderately dissatisfied* with my physical appearance
- ☐ *Slightly dissatisfied* with my physical appearance
- ☐ *Neither dissatisfied nor satisfied* with my physical appearance
- ☐ *Slightly satisfied* with my physical appearance
- ☐ *Moderately satisfied* with my physical appearance
- ☐ *Mostly satisfied* with my physical appearance
- ☐ *Extremely satisfied* with my physical appearance

2. Right now I feel...

- ☐ *Extremely dissatisfied* with my body size and shape
- ☐ *Mostly dissatisfied* with my body size and shape
- ☐ *Moderately dissatisfied* with my body size and shape
- ☐ *Slightly dissatisfied* with my body size and shape
- ☐ *Neither dissatisfied nor satisfied* with my body size and shape
- ☐ *Slightly satisfied* with my body size and shape
- ☐ *Moderately satisfied* with my body size and shape
- ☐ *Mostly satisfied* with my body size and shape
- ☐ *Extremely satisfied* with my body size and shape

3. Right now I feel...

- ☐ *Extremely dissatisfied* with my weight
- ☐ *Mostly dissatisfied* with my weight
- ☐ *Moderately dissatisfied* with my weight
- ☐ *Slightly dissatisfied* with my weight
- ☐ *Neither dissatisfied nor satisfied* with weight
- ☐ *Slightly satisfied* with my weight
- ☐ *Moderately satisfied* with my weight
- ☐ *Mostly satisfied* with my weight
- ☐ *Extremely satisfied* with my weight

4. Right now I feel...

- ☐ *Extremely* physically *attractive*
- ☐ *Very* physically *attractive*
- ☐ *Moderately* physically *attractive*
- ☐ *Slightly* physically *attractive*
- ☐ *Neither attractive nor unattractive*
- ☐ *Slightly* physically *unattractive*
- ☐ *Moderately* physically *unattractive*
- ☐ *Very* physically *unattractive*
- ☐ *Extremely* physically *unattractive*

5. Right now I feel...

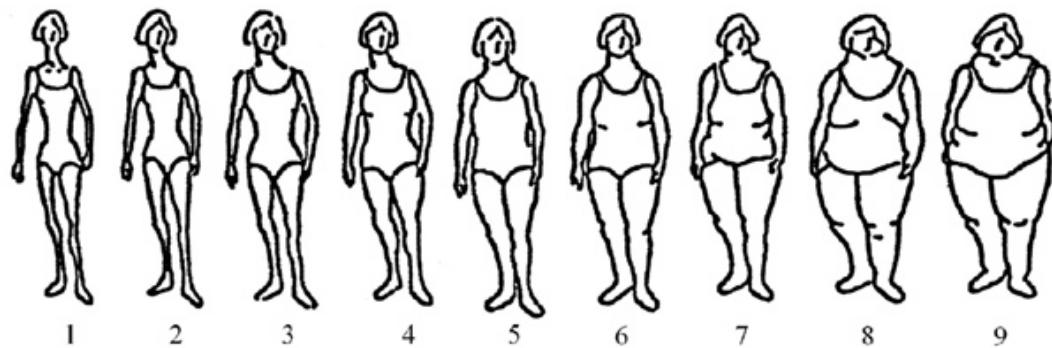
- ☐ *A great deal worse* about my looks than I usually feel
- ☐ *Much worse* about my looks than I usually feel
- ☐ *Somewhat worse* about my looks than I usually feel
- ☐ *Just slightly worse* about my looks than I usually feel
- ☐ *About the same* about my looks as usual
- ☐ *Justly slightly better* about my looks than I usually feel
- ☐ *Somewhat better* about my looks than I usually feel
- ☐ *Much better* about my looks than I usually feel
- ☐ *A great deal better* about my looks than I usually feel

6. Right now I feel that I look...

- ☐ *A great deal better* than the average person looks
- ☐ *Much better* than the average person looks
- ☐ *Somewhat better* than the average person looks
- ☐ *Just slightly better* than the average person looks
- ☐ *About the same* as the average person looks
- ☐ *Justly slightly worse* than the average person looks
- ☐ *Somewhat worse* than the average person looks
- ☐ *Much worse* than the average person looks
- ☐ *A great deal worse* than the average person looks

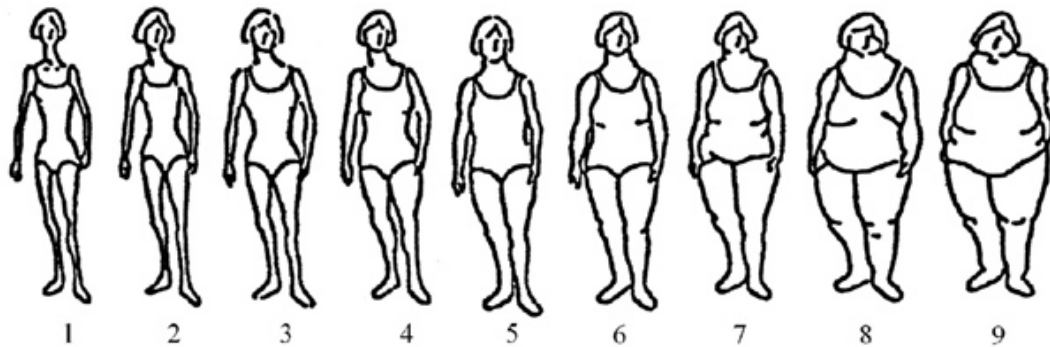
## Appendix Q

## FIGURE RATING SCALE



^

1. Compared to this average obese person, select the figure that best represents your current body size.



^

2. Compared to this average obese person, select the figure that best represents your ideal body size.”

## Appendix R

## PARTICIPANT POOL RECRUITMENT ADVERTISEMENT – Study 2

## Online Component:

**Title:** Individual Differences and Mental Health**Researchers:** Jean Kim, Dr. Josée Jarry**Duration:** 30 minutes**Credits:** 0.5 credits

The purpose of this study is to explore the relationships between individual differences and various mental health factors in undergraduate students. This study will be completed in an online survey format. You will be asked to complete a series of questionnaires related to mental health and individual differences. This study will take approximately 30 minutes to complete and will be done in one session.

Participants who complete this study will receive 0.5 bonus points for 30 minutes of participation towards the Psychology Participant Pool, if registered in the pool and enrolled in one or more eligible courses.

## Laboratory Component

**Title:** Memory for Health Information**Researchers:** Jean Kim, Dr. Josée Jarry**Duration:** 60 minutes**Credits:** 1.0 credit

The purpose of this study is to examine memory for health information using an experimental task. This study will be conducted in a lab within the psychology department. You will be presented with basic health information, complete a battery of questionnaires, and complete a memory task. This study will take approximately 60 minutes to complete and will be done in one session.

Participants who complete this study will receive 1.0 bonus points for 60 minutes of participation towards the Psychology Participant Pool, if registered in the pool and enrolled in one or more eligible courses.

## Appendix S

**LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: **Individual Differences and Mental Health**

You are asked to participate in a research study conducted by Jean Kim and supervised by Dr. Josée Jarry from the Department of Psychology at the University of Windsor. The study results will be used to fulfil the requirements of a Doctoral dissertation.

If you have any questions or concerns about the research, please feel to contact Jean Kim at kim11f@uwindsor.ca, or Dr. Josée Jarry at 519-253-3000 ext. 2237.

**PURPOSE OF THE STUDY**

The purpose of this study is to explore the relationships between individual differences in various psychological factors and mental health in undergraduate students.

**PROCEDURES**

If you volunteer to participate in this study, you will be asked to do the following things. You will be asked to complete a series of questionnaires related to mental health, mood, and individual differences. At the end of the study, you will be directed to a separate form that will ask you to provide your name and student number to verify your bonus credit for participation.

The entire study will take approximately 30 minutes of your time. The study must be completed in one online session. If you volunteer to participate, please set aside an uninterrupted half hour and complete the study in a quiet area without distractions.

**POTENTIAL RISKS AND DISCOMFORTS**

You will be asked some questions that are personal in nature. A risk of this study is the possibility that thinking about these personal issues may cause some psychological or emotional discomfort. If you have any concerns you wish to discuss, please feel free to contact the principal investigator, Jean Kim, the faculty advisor, Dr. Josée Jarry, or the Student Counselling Centre at 519-253-3000 ext. 4616.

**POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY**

Participating in this study will provide you with an opportunity to learn about psychological research. Specifically, you will gain knowledge in conducting psychological research online. Also, you may learn more about yourself and mental health. Finally, participating in this research will contribute to scientific knowledge about individual differences and mental health outcomes in undergraduate students.

**COMPENSATION FOR PARTICIPATION**

You will receive 0.5 bonus point towards a psychology course for 30 minutes of participation, provided you are registered in the psychology participant pool and enrolled in one or more eligible courses.

**CONFIDENTIALITY**

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. At the end of the study, we must collect your name and student number for you to receive your bonus credit. However, your data will be kept separate from any identifying information. All files will be encrypted and password-protected, and will be stored in the

University of Windsor data servers. Your data will be retained for 10 years, after which it will be securely deleted from the servers.

## PARTICIPATION AND WITHDRAWAL

Your participation in this study is completely voluntary. If you decide to participate, you may withdraw at any time during the study by clicking on the "Discard responses and exit" button without negative consequences of any kind. However, if you choose to withdraw before completing the survey, you will not receive the bonus credit. You may refuse to answer any questions you do not want to answer by leaving the question blank, and still remain in the study. We encourage you to answer all questions with which you are comfortable answering, as your responses are important to our investigation. After completing the session, you will have the option of removing your data from the study. You will be awarded the bonus credit if you complete the survey, regardless of whether you choose to include or remove your data from the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

## FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

Once the research is complete, results will be available to all participants on the University of Windsor REB website.

Web address: [www.uwindsor.ca/reb](http://www.uwindsor.ca/reb)

Date when results are available: December 2017

## SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications, and in presentations. If so, any identifying information will be confidential, and only group data will be reported.

## RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

## SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Jean Kim, M.A.

Department of Psychology

University of Windsor

**It is recommended that you print out a copy of this letter of information for your records. It also is recommended that you turn off your pop-up blockers before beginning the survey, should you choose to do so.**

## CONSENT OF RESEARCH PARTICIPANT

"I understand the information provided for the study 'Perceiving People and Individual Differences' described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I will print a copy of this form for my own reference."

To acknowledge that you have read the letter of information, and that you are providing informed consent to participate in this study, please click "I agree" below.

I agree

No thank you

## Appendix T

## POST-STUDY INFORMATION DEBRIEFING FORM

Thank you for participating in this study. Your time and willingness to participate are greatly appreciated.

After reading the following post-study information, please go to \*URL\* to receive your bonus credit.

Body image is a complex psychological experience related to one's physical appearance. It involves perceptions and attitudes toward oneself, including thoughts, feelings, and behaviours related to one's physical appearance. In modern society, being dissatisfied with one's body has become so common that it is considered to be "normal", especially amongst young women. This has led to higher tendencies to monitor and scrutinize one's body to ensure that it meets cultural ideals. Unfortunately, problems with body image are related to many different negative psychological outcomes. For example, being dissatisfied with one's body is related to worse mood, including more symptoms of depression, and also worse self-esteem. This study examined the relationship between body image and these mental health outcomes.

For further information on these topics, please consult the following references:

Cash, T. F., Morrow, J. A., Hrabosky, J. I., & Perry, A. A. (2004). How has body image changed? A cross-sectional investigation of college women and men from 1983 to 2001. *Journal of Consulting and Clinical Psychology*, 72, 1081-1088.

Lowery, S. E., Kurpius, S. E. R., Befort, C., Blanks, E. H., Sollenberger, S., Nicpon, M. F., & Huser, L. (2005). Body image, self-esteem, and health-related behaviors among male and female first year college students. *Journal of College Student Development*, 46, 612-623.

Wiederman, M. W., & Pryor, T. L. (2000). Body dissatisfaction, bulimia, and depression among women: The mediating role of drive for thinness. *International Journal of Eating Disorders*, 27, 90-95.

If you have any concerns about the study, or if you are interested in additional information, please feel free to contact the primary investigator, Jean Kim, at [kim11f@uwindsor.ca](mailto:kim11f@uwindsor.ca). **Please print this page for your reference.**

If you wish to talk about any personal issues that came to your attention today, please contact the Student Counselling Centre at 519-253-3000 ext. 4616.

Additional Community Resources:

Bulimia Anorexia Nervosa Association



Telephone: 519-969-2112

Email: [info@bana.ca](mailto:info@bana.ca)

Website: [www.bana.ca](http://www.bana.ca)

Community Crisis Centre of Windsor

Telephone: 519-973-4435

Website: <http://windsoressex.cioc.ca/record/WIN0762>

Distress Centre – Windsor-Essex County

Telephone: 519-256-5000

Website: [www.dcwindsor.com](http://www.dcwindsor.com)

## Appendix U

**LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: **Memory for Health Information**

You are asked to participate in a research study conducted by Jean Kim and supervised by Dr. Josée Jarry from the Department of Psychology at the University of Windsor. The study results will be used to fulfil the requirements of a Doctoral dissertation.

If you have any questions or concerns about the research, please feel to contact Jean Kim at kim11f@uwindsor.ca, or Dr. Josée Jarry at 519-253-3000 ext. 2237.

**PURPOSE OF THE STUDY**

The purpose of this study is to examine memory for health information using an experimental task in undergraduate students.

**PROCEDURES**

If you volunteer to participate in this study, you will be asked to do the following things. You will be presented with basic health information, complete a battery of questionnaires, and complete a memory task. At the end of the study, you will provide your name and student number to verify your bonus credit for participation.

The entire study will take approximately 60 minutes of your time. The study must be completed in one session. By signing this consent form you are indicating that you wish to participate in the present study.

**POTENTIAL RISKS AND DISCOMFORTS**

You will be asked some questions that are personal in nature. A risk of this study is the possibility that thinking about these personal issues may cause some psychological or emotional discomfort. You will be provided with the opportunity to discuss these concerns thoroughly with the experimenter. If you have any concerns you wish to discuss with an independent party, please feel free to contact the Student Counselling Centre at 519-253-3000 ext. 4616.

**POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY**

Participating in this study will provide you with an opportunity to learn about psychological research. Specifically, you will gain knowledge in conducting experimental psychological research. Also, you may learn more about yourself, your perceptions of people, and basic health information. Finally, participating in this research will contribute to scientific knowledge about individual differences and memory for health information in undergraduate students.

**COMPENSATION FOR PARTICIPATION**

You will receive 1.0 bonus point towards a psychology course for 60 minutes of participation, provided you are registered in the psychology participant pool and enrolled in one or more eligible courses.

**CONFIDENTIALITY**

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. At the end of the study, we must collect your name and student number for you to receive your bonus credit. However, your data will be kept separate from any identifying information. To ensure confidentiality, you will be identified by participant number only, and there will be no identifying features on the questionnaires. Your data will be kept separate from your name and student number. Computer data will be encrypted and password protected, and

will be stored on secure online data servers. Hard-copy data will be securely stored in a locked filing cabinet. Your data will be retained for 10 years, after which point computer data will be securely deleted from the servers and hard-copy data will be shredded.

## PARTICIPATION AND WITHDRAWAL

Your participation in this study is completely voluntary. If you decide to participate, you are free to withdraw from further participation in the research at any time without having to give a reason, and without penalty. A decision not to participate will not affect your academic standing or your relationship with the university. You may refuse to answer any questions that you are not comfortable answering. Following your participation, you may exercise the option of removing your data from this study. The investigator may withdraw you from this research if circumstances arise which warrant doing so (e.g., very incomplete questionnaires).

## FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

Once the research is complete, results will be available to all participants on the University of Windsor REB website.

Web address: [www.uwindsor.ca/reb](http://www.uwindsor.ca/reb)

Date when results are available: July 2018

## SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications, and in presentations. If so, any identifying information will be confidential, and only group data will be reported.

## RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

## SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

"I understand the information provided for the study, "Memory for Health Information" as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I will print a copy of this consent form for my own reference."

## SIGNATURE OF PARTICIPANT

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Date

## SIGNATURE OF INVESTIGATOR

"In my judgement, the participant is voluntarily and knowingly giving informed consent to participate in this research study. These are the terms under which I will conduct research."

\_\_\_\_\_  
Date

## Appendix V

## Brief Memory Test

**Fat Stereotype Challenge Condition**

1. Research indicates what percentage of BMI is attributable to genetics?
  - a. 10-20%
  - b. 20-35%
  - c. 35-50%
  - d. 50-70%
2. Researchers believe that overeating has a biological basis, arising from survival instincts. T/F
3. Evidence exists for a gene that encodes a 'fat mass and obesity-associated protein', also known as the \_\_\_\_ gene
  - a. FTO
  - b. BMI
  - c. BMO
  - d. FAT
4. It is theorized that consumption of sweetened foods causes immediate release of \_\_\_\_\_ in the brain
  - a. GABA
  - b. Endorphins
  - c. Stress hormones
  - d. none of the above
5. Food marketing successfully influences children's food preferences and requests. T/F

**Fat Stereotype Support Condition**

1. The less one engages in physical exercise, the more likely they are to:
  - a. Gain excess weight
  - b. Over eat
  - c. Lose weight
  - d. None of the above
2. Only about half of Canadians aged 12 and over are considered to be active or moderately active. T/F
3. Research has found that greater engagement in \_\_\_\_\_ is a leading contributor to obesity.
  - a. Exercise
  - b. Sedentary behaviour
  - c. Sports

d. Dieting

4. Consuming more energy on one day leads to:
  - a. decreases in consumption the day after
  - b. no affect in consumption the day after
  - c. similar increases in consumption the day after.
  - d. none of the above
5. The increase in the prevalence of obesity over the past several decades has coincided with an increase in portion sizes. T/F

Appendix W  
INFORMATION AND DEBRIEFING FORM

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Thank you for your participation in this study. Before explaining the true purpose of this research, it is important that you understand why it is necessary for some kinds of psychological studies not to tell people all about the purpose of the study at the very beginning. In some kinds of studies, if we tell people what the purpose of the experiment is and what we predict about how they would react under particular conditions, they might deliberately do whatever they think we want them to do, just to help us out and give us the results that they think we want. If that happened, their reactions would not be a good indication of how they might truly react in a situation in everyday life, where they didn't think they were being studied. It is also possible that the opposite might occur and that people might think that if we predicted that they would do a certain thing, they might deliberately not do it to show us that we can't figure them out. This would also make the results invalid, because again, what people would be responding to is what they thought we were looking for rather than responding naturally.

You were told that that you have just participated in a study examining memory for health information. This was untrue. In actual fact, the study that you just participated in is looking at how increasing or decreasing beliefs in fat stereotypes, such as laziness or poor willpower, affects body satisfaction and physical comparisons against others. We are particularly interested in the reactions of women who highly monitor their body, also known as body surveillance. It is expected that women who have a high tendency to monitor their body will have a greater tendency to compare themselves to physically inferior others when their weight-based stereotypes are strengthened. This, in turn, is expected to improve body satisfaction. This paints an unfortunate picture whereby people derogate others to improve their own body satisfaction, though not necessarily intentionally. Rather than using this route to improve body satisfaction, it is possible to feel good about one's body without derogating others. How people feel about their body is important because negative body image feelings are a major trigger for eating disorders. So, it is important for psychologists to have as much information as possible about body image.

In this study, you read a report explaining various determinants of body weight. Though the information presented to you in the report is true and supported by research, it only presents part of the picture on determinants of weight.

[Support Condition]

The report that you read summarized behavioural determinants of weight that are controllable by an individual, such as physical activity and dietary choices. This was intended to temporarily increase beliefs in fat stereotypes. However, there are several determinants of weight that are outside of personal control. These include genetics and biological causes, environmental factors, and economic emphasis on consumption. We will provide an overview of these contributors with you now, so that you gain a more complete picture on the causes of obesity. (Review uncontrollable determinants of weight)

[Challenge Condition]

The report that you read summarized genetic, biological, and environmental determinants of weight that are uncontrollable by an individual. However, there are other factors that people can change if they so wished. These include behavioural factors, such as physical activity and dietary choices. We will provide an overview of these contributors with you now, so that you gain a more complete picture on the causes of obesity. (Review controllable determinants of weight)

It should now be clear that determinants of weight are extremely complex, and involves an interaction between one's genetics, environment, and behaviours. This means that though people can choose to engage in healthy behaviours, weight is not simply a matter of self-control. Overweight and obesity are *not* representative of character flaws in an individual that are commonly described in fat stereotypes, such as laziness or lack of willpower. Unfortunately, these stereotypes often lead to discrimination, ridicule, and unjust treatment toward individuals perceived to carry excess weight. Instead, a person's weight is embedded within a greater context of one's biology and genetics, education on healthy choices, one's food environment, and global food systems that promote excess consumption. We hope that you take away this message that weight is far more complex of an issue than portrayed in overgeneralized and harmful stereotypes about people with overweight.

As in most psychological research, we are interested in how the average person reacts to an experimental task. We need to test many people and combine their results to get a good indication of how the average person reacts under the different conditions. In order for us to draw any conclusions, we have to combine the data we got from you with data we get from other people so that we have enough data to draw conclusions. What this means is that there will be many people participating in this study. It is going to be necessary for us to ask you not to say anything about the study to anyone else. If you talked to someone else about the study then they participated in the study, their reactions wouldn't be spontaneous and natural and their results couldn't be used and combined with your data and those from other people. If that happened, we wouldn't have enough data to make conclusions about the average person, so the whole study really would be for nothing. I hope you can see why it is extremely important that I ask you not to say anything about the study. You might think that it won't make a difference if you talk to your roommate about it because they'll never be in the study, but your roommate might say something to someone else who might be in the study. So, I would like to ask you not to say anything about the study, other than you did some cognitive tasks and filled out some questionnaires until at least the end of the semester.

We hope you found your experience of participating in this study interesting. I would be glad to answer any questions you might have. If you are interested in learning more about research on weight stigma, body surveillance, and body dissatisfaction, good resources are:

Frederick, D. A., Forbes, G. B., Grigorian, K. E., & Jarcho, J. M. (2007). The UCLA body project I: Gender and ethnic differences in self-objectification and body satisfaction among 2,206 undergraduates. *Sex Roles: A Journal of Research*, 57(5-6), 317-327. doi:10.1007/s11199-007-9251-z

Friedman, K. E., Reichmann, S. K., Costanzo, P. R., Zelli, A., Ashmore, J. A., & Musante, G. J. (2005). Weight stigmatization and ideological beliefs: Relation to psychological functioning in obese adults. *Obesity Research*, 13(5), 907-916. doi:10.1038/oby.2005.105

Puhl, R., & Brownell, K. D.. (2001). Bias, discrimination, and obesity. *Obesity Research*, 9(12), 788-805.

O'Brien, K. S., Caputi, P., Minto, R., Peoples, G., Hooper, C., Kell, S., & Sawley, E. (2009). Upward and downward physical appearance comparisons: Development of scales and examination of predictive qualities. *Body Image*, 6, 201-206.

#### CONTACT INFORMATION

If you have any concerns at all about the study itself, or are interested in receiving more information, please feel free to contact the primary investigator, **Jean Kim**, at [kim11f@uwindsor.ca](mailto:kim11f@uwindsor.ca), or the faculty supervisor, **Dr. Josée Jarry** at (519) 253-3000, ext. 2237.

If you wish to talk about any issues that came to your attention today, I encourage you to discuss your reactions with me. If you wish to talk to an outside party, please feel free to contact the **University of Windsor Student Counselling Centre** at 519-253-3000 Ext. 4616. Other helpful resources in the community include the **Community Crisis Centre of Windsor** at 519-973-4435, and the **Windsor-Essex County Distress Centre** at 519-256-5000.

This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the **Research Ethics Coordinator**, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

#### CONSENT TO DATA RETENTION

If you consent below, the data you have provided will be used in this study. You are free to decide not to consent without having to give a reason and without penalty. If you do not consent, the data will be destroyed.

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"I have read and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to allow my data to be used in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep."

#### SIGNATURE OF PARTICIPANT

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Name of Participant

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Date

#### SIGNATURE OF INVESTIGATOR

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Date



## VITA AUCTORIS

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